

CARTRIDGE HEATERS

High efficiency and long life, trusted by professionals!!

ULTRA FIVE

HL Type / SL Type Cartridge Heaters

Inch Size Cartridge Heaters

New Ultra Five

L Type Cartridge Heaters

Cartridge Heaters w/ Internal Thermocouple

NEW L Type w/ Internal Thermocouple

Cartridge Heaters w/ Flange

ULTRA W800

ULTRA W

ULTRA WL

ULTRA W TITANIUM



HAKKO ELECTRIC CO., LTD.

www.hakko.co.jp

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Professional cartridge heaters with outstanding durability that can be trusted by users.

Hakko's cartridge heaters "Ultra Five" has earned great trust from many users due to its excellent durability. Stable operation for long period is assured for molding dies, hot plates or other applications where breakdowns are not tolerated.

High Efficiency

High precision heaters that are developed through many years of research and practical applications. The heat generated from the heating wires are transferred to the object to be heated without loss.

Long Life

Longer life compared to conventional products with the use of high performance nickel alloy for heating wire, and temperature resistant insulation magnesia developed originally by our company.

Robust

Metal sheath is made of stainless steel pipe (SUS304). Robust structure designed to withstand mechanical vibrations or shocks, which has passed long-term testing.

Excellent Electrical Properties

Excellent electrical insulation and maintains stable insulation performance even at high temperatures.

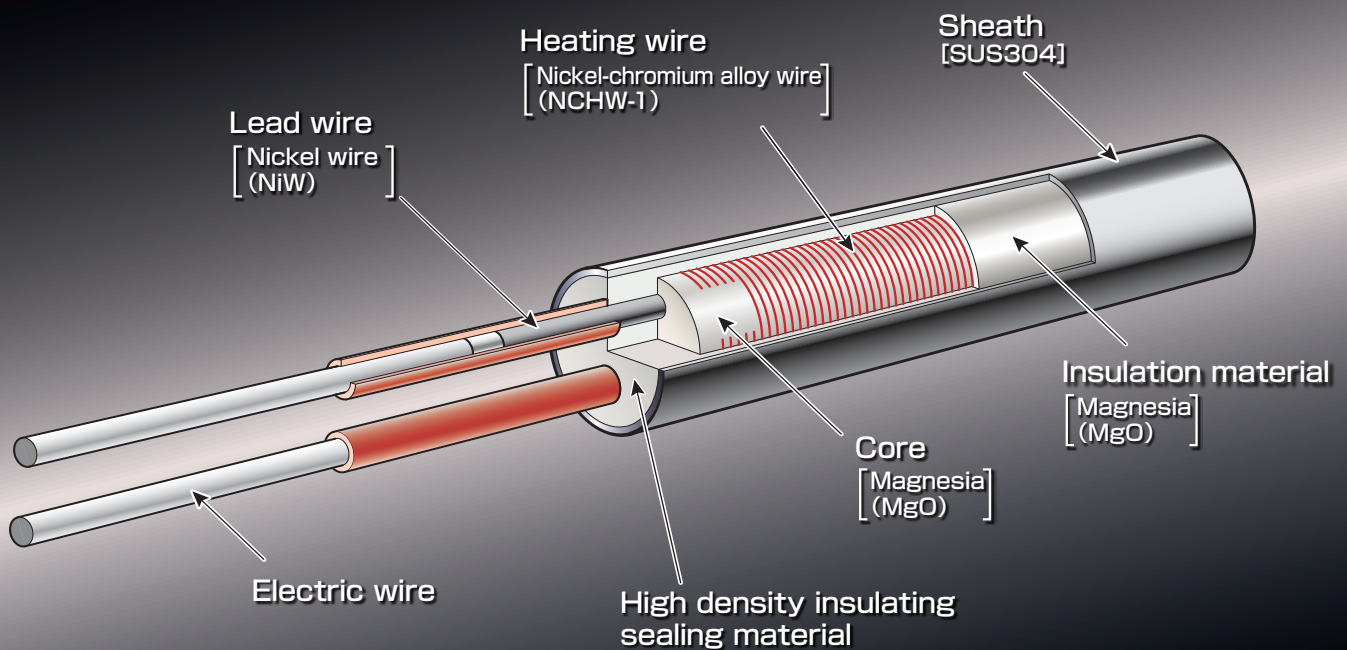
Workability

Smooth and compact wiring can be done even for multiple installations.

Wide Variety

Wide variety of products to meet the needs of customers. In addition to millimeter and inch size series, lineup for "water heating" is also available.

The structure of Hakko cartridge heater "Ultra Five" (HL type is shown in the figure)



● Sheath

The sheath of cartridge heater is the part that is in direct contact with the object to be heated, therefore it is required that it can efficiently transfer heat, fitted easily and robust. Moreover, it is also important that it has good machinability. Standard specifications "Ultra Five" uses SUS304 for the sheath. For special applications, NCF800 or titanium are also available.

● Insulation material

The insulation material separates the heating wire from the sheath. For "Ultra Five", the electrical insulation is excellent at high temperatures. Magnesium oxide (MgO, magnesia) with outstanding thermal conductivity is used. High insulation performance is proven for long usage.

● Heating wire

Heating wire is crucial to the cartridge heater. The heating wire for "Ultra Five" uses good quality high performance nickel alloy, which has low impurities and no unevenness in resistance or wire diameter. The high performance nickel alloy is wound with high precision and densely sealed with insulation material.

● Core

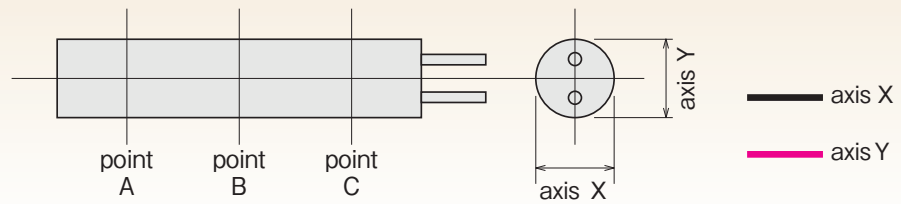
Located at the center of the cartridge heater, it is wound with heating wire. Magnesia ceramics which are magnesia that is baked with high precision are used.

Structure and performance of products from other manufacturers

Although the tubular shape of cartridge heaters appears to be the same for all manufacturers, the structure and dimensional accuracy varies significantly. The following is a comparison of some products obtain from several manufactures in Japan and the United States. The comparison was conducted for heaters with length of 50mm. Pictures of heaters with length of 190mm was also included for reference.

Appearance and dimensions

The appearance (top: length 190mm, bottom: length 50mm) and heater sheath diameter (for heater of length 50mm) of cartridge heaters from several manufactures are shown as follows. Some heaters have diameters which varies with position, while others have excellent precision.



	Appearance	Sheath diameter
Company A		
Company B		

	Appearance	Sheath diameter
Company C		
Company D		
Company E		
Company F		
Hakko		

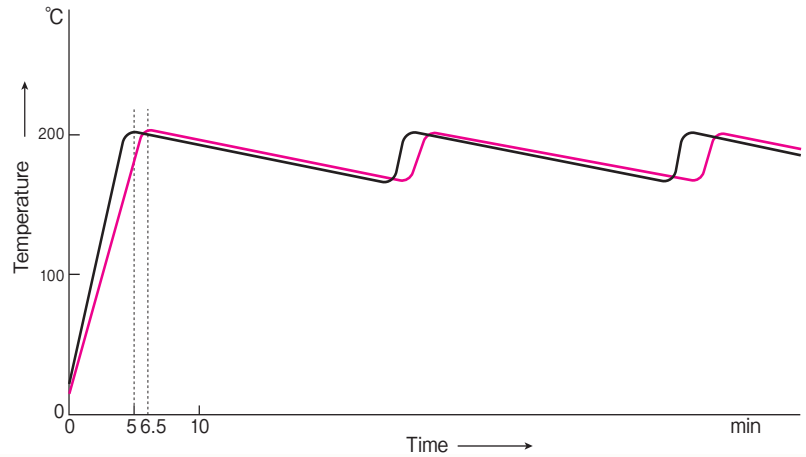
Response performance

The test was setup with a $\phi 12 \times L50$ cartridge heater inserted into the $\phi 12.5$ hole of a $\phi 62.5 \times L50$ metal cylinder. Temperature was controlled with the settings of 180°C OFF and 150°C ON.

After switching on power supply, the metal cylinder reaches 200°C in 5-6.5mins, depending on the heater used. The temperature recorded is higher than the temperature set because of overshooting. This graph is one of the examples. The better the response (shorter time), the higher the efficiency for applications such as resin molding.

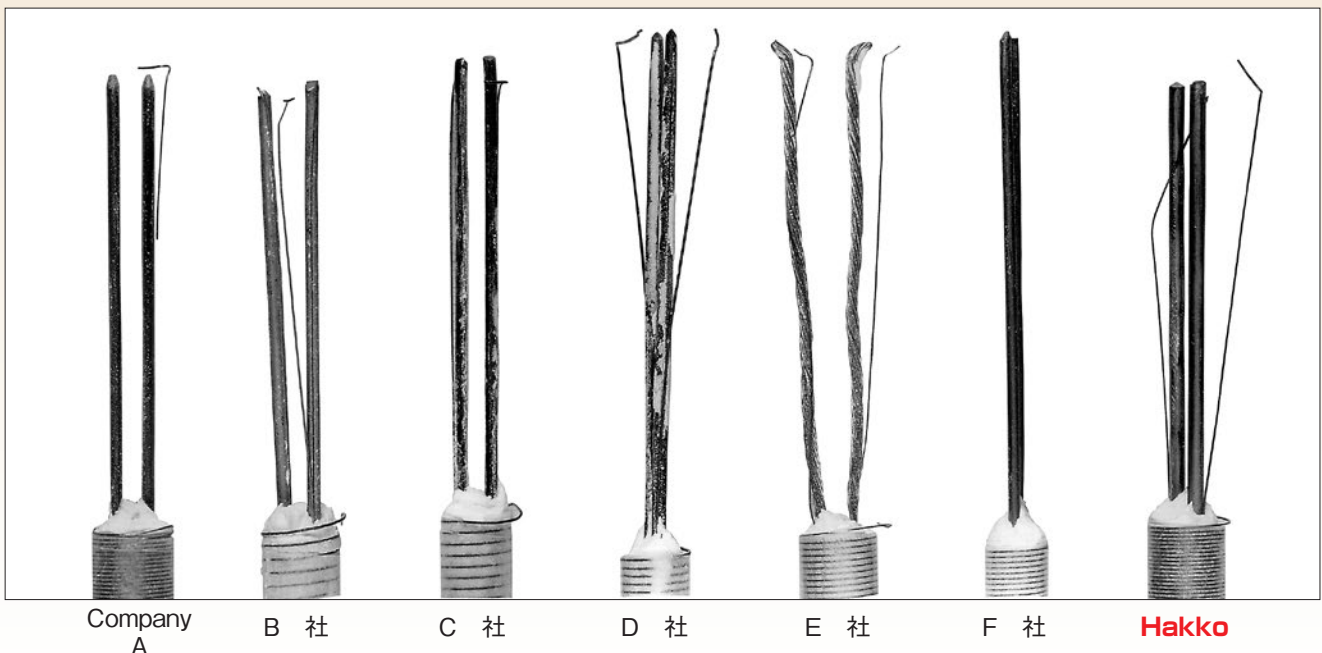
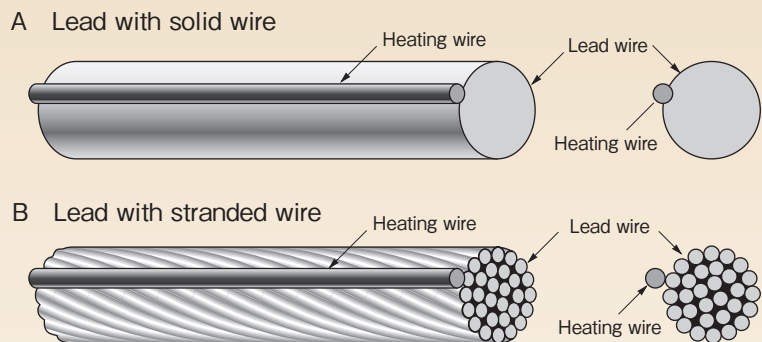
Even with the same wattage, heaters that can conduct internal heat from heating wire to outer parts will result in less heat trapped internally, therefore providing faster temperature rise with excellent response performance.

Manufacturer	Company A	Company B	Company C	Company D	Company E	Company F	Hakko
Time (min) to reach 200°C	5.5	5	5	6.5	6	6	5



Connection structure of lead with heating wire

This is the structure of the connection between the lead and heating wire. As shown in figure A, heating wire that "bites" into the lead is considered good. If connection is loose, overheat will occur due to contact resistance, and wire will break easily.



Durability

Time until wire breaks was measured in a test in which a $\phi 12 \times L50$ cartridge heater was inserted into the $\phi 12.5$ hole of a $\phi 62.5 \times L50$ metal cylinder. The voltage for the cartridge heater adjusted until surface watt density is $30W/cm^2$, and temperature of the metal cylinder is controlled at $300^\circ C$.

Manufacturer	Company A	Company B	Company C	Company D	Company E	Company F	Hakko
Time until wire breaks	60 hrs	50 min	1.5 min	1 min	35 min	2 min	100 hrs

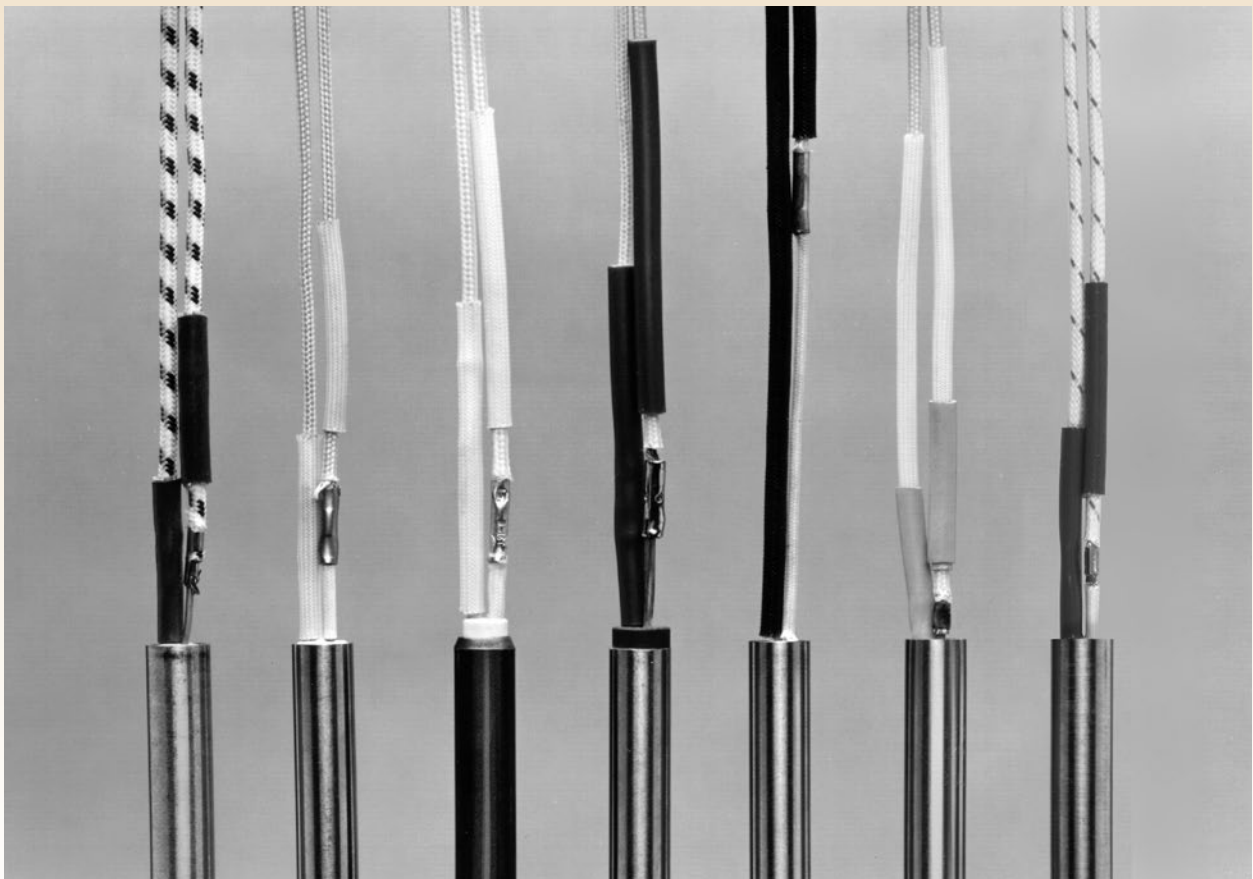
Insulation performance

Test is performed using our company's standard methods.

Manufacturer	Company A	Company B	Company C	Company D	Company E	Company F	Hakko
Cold insulation resistance (M Ω)	100	400	600	2000	400	400	200
Hot insulation resistance (M Ω)	100	160	26	45	10	65	100
Withstand voltage 1800V	OK	OK	OK	OK	OK	OK	OK

Connection structure of lead with electric wire

The lead is connected to the electric wire by crimping. If crimping is loose, temperature will rise due to contact resistance. If crimping is too tight, electric and lead wire will be damaged.



Company
A

Company
B

Company
C

Company
D

Company
E

Company
F

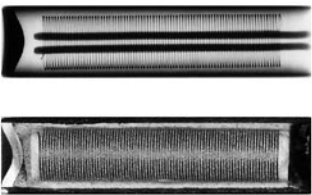
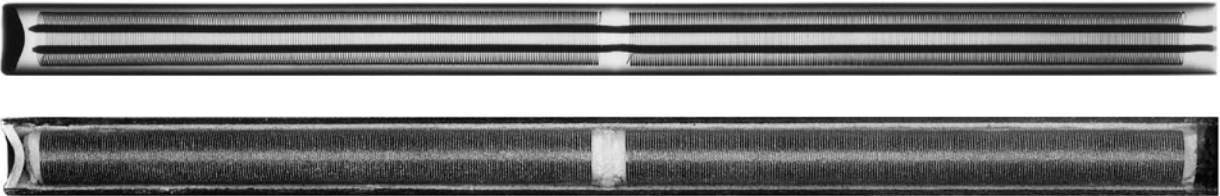
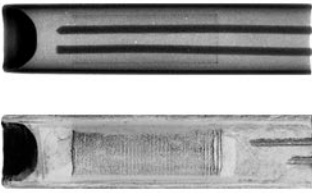
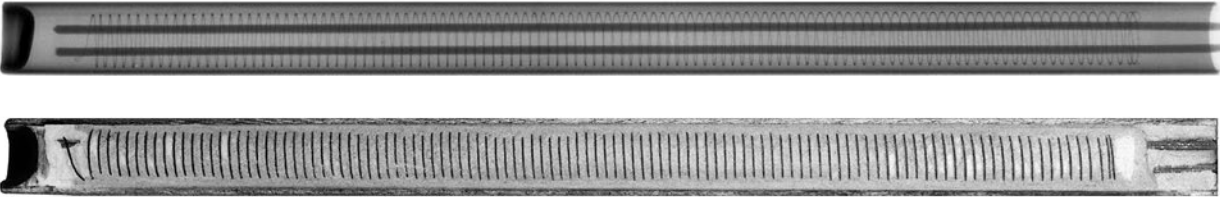
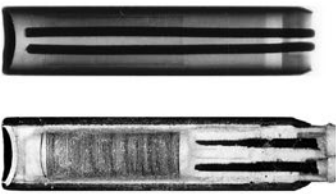
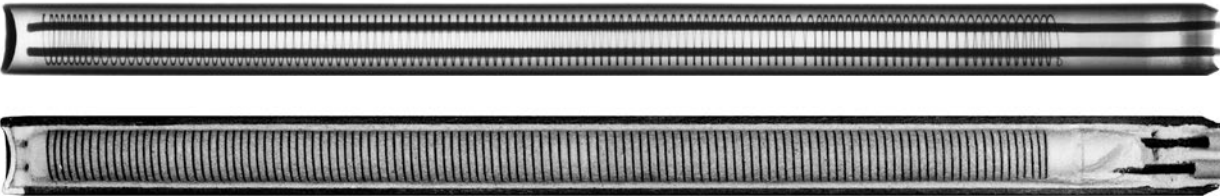
Hakko

Structure of heating element

Heating element is the heart of the heater. The points that should be noted are as follows:

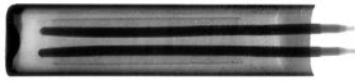
- Is the winding of the heating wire precise or rough
- Is the heating wire thick or fine
- Is the heating wire winded from end to end
- Is the insulation layer thick or thin
- How is the condition of the lead wires

The pictures for each heaters are Top : X-ray
 Bottom : Dismantled

Company A	<p>$\phi 12.7 \times 50$ 120V 200W</p> 	<table border="1"> <tr> <td>Wire diameter</td> <td>: $\phi 0.28$</td> </tr> <tr> <td>Winding diameter</td> <td>: $\phi 8.99$</td> </tr> <tr> <td>Winding count</td> <td>: 78</td> </tr> <tr> <td>Pitch</td> <td>: 0.5</td> </tr> <tr> <td>Length</td> <td>: 39</td> </tr> <tr> <td>Lead wire diameter</td> <td>: $\phi 0.5$</td> </tr> <tr> <td>Insulation layer thickness</td> <td>: 1.04</td> </tr> </table>	Wire diameter	: $\phi 0.28$	Winding diameter	: $\phi 8.99$	Winding count	: 78	Pitch	: 0.5	Length	: 39	Lead wire diameter	: $\phi 0.5$	Insulation layer thickness	: 1.04
	Wire diameter		: $\phi 0.28$													
Winding diameter	: $\phi 8.99$															
Winding count	: 78															
Pitch	: 0.5															
Length	: 39															
Lead wire diameter	: $\phi 0.5$															
Insulation layer thickness	: 1.04															
<p>$\phi 12.7 \times 200$ 120V 1kW</p> 																
Company B	<p>$\phi 12 \times 50$ 200V 100W</p> 	<table border="1"> <tr> <td>Wire diameter</td> <td>: $\phi 0.11$</td> </tr> <tr> <td>Winding diameter</td> <td>: $\phi 8.2$</td> </tr> <tr> <td>Winding count</td> <td>: 78</td> </tr> <tr> <td>Pitch</td> <td>: 0.32</td> </tr> <tr> <td>Length</td> <td>: 25</td> </tr> <tr> <td>Lead wire diameter</td> <td>: $\phi 0.94$</td> </tr> <tr> <td>Insulation layer thickness</td> <td>: 1.01</td> </tr> </table>	Wire diameter	: $\phi 0.11$	Winding diameter	: $\phi 8.2$	Winding count	: 78	Pitch	: 0.32	Length	: 25	Lead wire diameter	: $\phi 0.94$	Insulation layer thickness	: 1.01
	Wire diameter		: $\phi 0.11$													
Winding diameter	: $\phi 8.2$															
Winding count	: 78															
Pitch	: 0.32															
Length	: 25															
Lead wire diameter	: $\phi 0.94$															
Insulation layer thickness	: 1.01															
<p>$\phi 12 \times 190$ 200V 800W</p> 																
Company C	<p>$\phi 12 \times 50$ 200V 100W</p> 	<table border="1"> <tr> <td>Wire diameter</td> <td>: $\phi 0.09$</td> </tr> <tr> <td>Winding diameter</td> <td>: $\phi 7.8$</td> </tr> <tr> <td>Winding count</td> <td>: 79</td> </tr> <tr> <td>Pitch</td> <td>: 0.28</td> </tr> <tr> <td>Length</td> <td>: 22</td> </tr> <tr> <td>Lead wire diameter</td> <td>: $\phi 1.57$</td> </tr> <tr> <td>Insulation layer thickness</td> <td>: 1.17</td> </tr> </table>	Wire diameter	: $\phi 0.09$	Winding diameter	: $\phi 7.8$	Winding count	: 79	Pitch	: 0.28	Length	: 22	Lead wire diameter	: $\phi 1.57$	Insulation layer thickness	: 1.17
	Wire diameter		: $\phi 0.09$													
Winding diameter	: $\phi 7.8$															
Winding count	: 79															
Pitch	: 0.28															
Length	: 22															
Lead wire diameter	: $\phi 1.57$															
Insulation layer thickness	: 1.17															
<p>$\phi 12 \times 190$ 200V 800W</p> 																

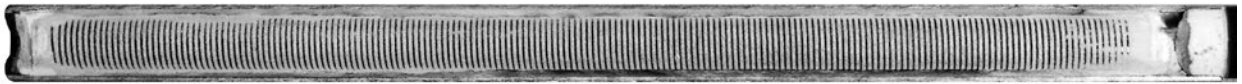
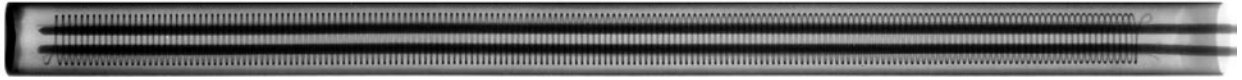
Company D

φ12×50
200V 100W



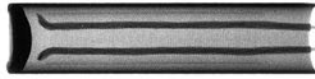
Wire diameter	: φ0.11
Winding diameter	: φ7.5
Winding count	: 124
Pitch	: 0.25
Length	: 31
Lead wire diameter	: φ1.8
Insulation layer thickness	: 1.62

φ12×190 200V 800W



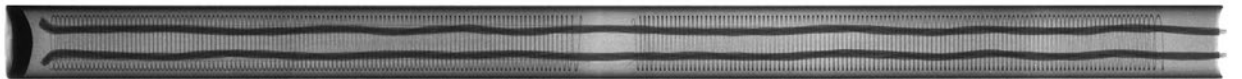
Company E

φ12×50
200V 100W



Wire diameter	: φ0.10
Winding diameter	: φ8.5
Winding count	: 94
Pitch	: 0.37
Length	: 35
Lead wire diameter	: 0.3×16 wires twisted
Insulation layer thickness	: 1.01

φ12×190 200V 800W



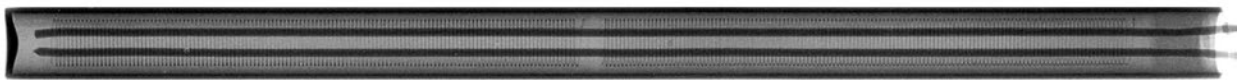
Company F

φ12×50
200V 100W



Wire diameter	: φ0.11
Winding diameter	: φ7.3
Winding count	: 106
Pitch	: 0.32
Length	: 34
Lead wire diameter	: φ0.95
Insulation layer thickness	: 1.22

φ12×190 200V 800W



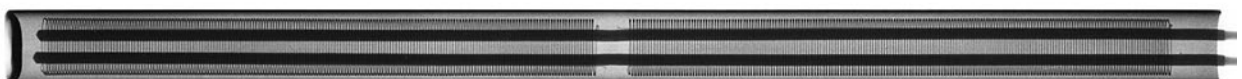
Hakko

φ12×50
200V 100W

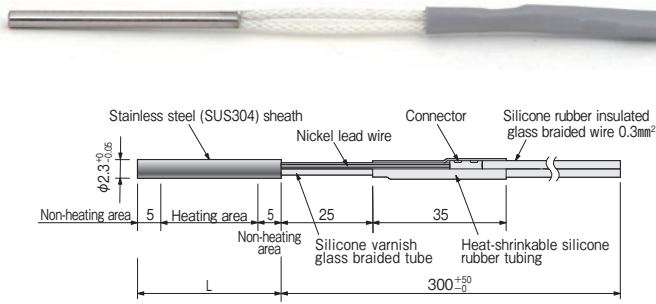


Wire diameter	: φ0.14
Winding diameter	: φ8.8
Winding count	: 139
Pitch	: 0.28
Length	: 39
Lead wire diameter	: φ2.05
Insulation layer thickness	: 1.01

φ12×190 200V 800W



Sheath diameter $\phi 2.3$



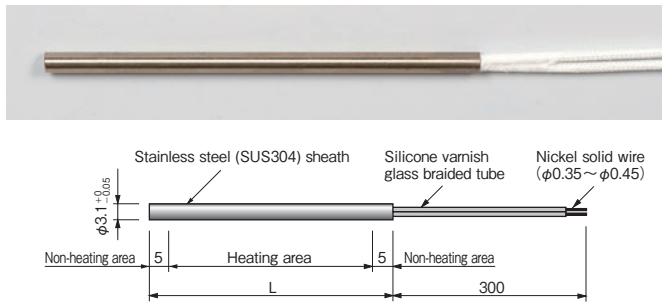
Withstand voltage: AC500V for 1min

WD : Watt density of the effective heating area

In stock	Model No.	Product code	Power voltage	Rated power (W)	dimension L (mm)	WD (W/cm ²)
○	HL Y0051	03080140	12V	5	15	14
○	HL Y0102	03080145	24V	10	20	
○	HL Y1203	03080150		20	30	
○	HL Y1354	03080155	100V	35	50	12
○	HL Y1605	03080160		60	80	
○	HL Y1806	03080165		80	100	

Transformer (model no. MSA1101, please refer Hakko's general catalog) can be used for 12V/24V heaters.

Sheath diameter $\phi 3.1$



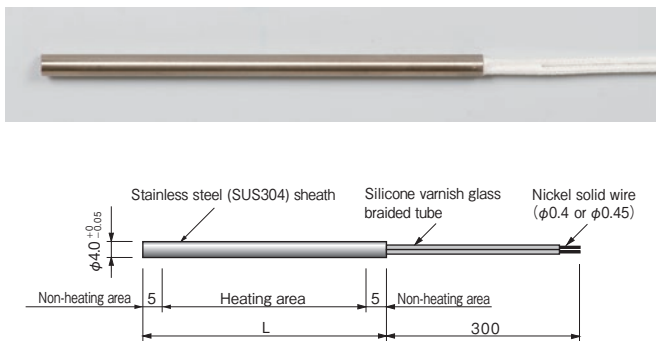
Withstand voltage: AC600V for 1min

WD : Watt density of the effective heating area

In stock	Model No.	Product code	Power voltage	Rated power (W)	dimension L (mm)	WD (W/cm ²)
	HL J0081	03089410	24V	8	25	5.5
	HL J0152	03089420		15	50	3.9
	HL J0203	03089430		20	75	3.2

Transformer (model No. MSA1101, please refer Hakko's general catalog) can be used for 24V heaters.

Sheath diameter $\phi 4.0$



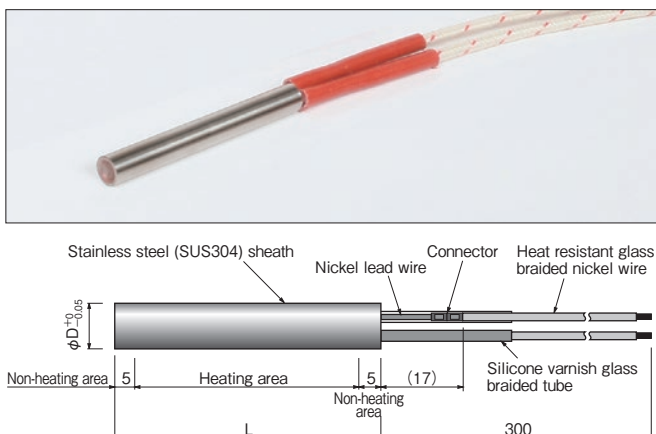
Withstand voltage: AC600V for 1min

WD : Watt density of the effective heating area

In stock	Model No.	Product code	Power voltage	Rated power (W)	dimension L (mm)	WD (W/cm ²)
	HL W0011	03089440	24V	10	25	5.3
	HL W0025	03089450		20	50	4.0
	HL W0036	03089460		30	75	3.8
○	HL W1021	03081640	100V	25	25	13
○	HL W1032	03081650		30	30	12
○	HL W1033	03081660		35	35	11
○	HL W1044	03081670		45	40	12
○	HL W1065	03081680		60	50	
○	HL W1106	03081690		100	80	11
○	HL W1127	03081700	120	100		
○	HL W2044	03082670	1P 200V	45	40	12
○	HL W2065	03082680		60	50	12
○	HL W2106	03082690		100	80	11
○	HL W2127	03082700		120	100	11

Transformer (model No. MSA1101, please refer Hakko's general catalog) can be used for 24V heaters.

Sheath diameter $\phi 6.0 \sim 14.0$



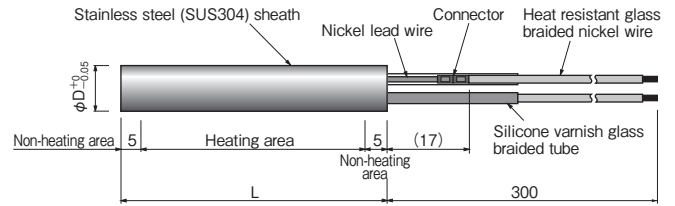
WD : Watt density of the effective heating area

		24V	Wire cross-sectional area	1.25 mm ²			
In stock	Model No.	Product code	dimension (mm)		Rated power (W)	WD (W/cm ²)	
			D	L			
	HL X0052	03089470	6.0	50	50	6.6	
	HL X0103	03089480		100	100	5.9	
	HL X0154	03089490		150	150	5.7	
	HL B0051	03089500	6.5	50	50	6.1	
	HL B0103	03089510		100	100	5.4	
	HL B0154	03089520		150	150	5.3	
	HLC0061	03089530	8.0	50	60	6.0	
	HLC0123	03089540		100	120	4.8	
	HLC0185	03089550		150	180	5.1	
	HLE0101	03089560	10.0	50	100	8.0	
	HLE0153	03089570		100	150	5.3	
	HLE0205	03089580		150	200	4.5	

Transformer (model No. MSA1101, please refer Hakko's general catalog) can be used for 24V heaters.

Sheath diameter $\phi 6.0 \sim 14.0$ 100V

Sheath diameter $\phi 6.0 \sim 14.0$



100V

WD : Watt density of the effective heating area WC : Wire cross-sectional area

In stock	Model No.	Product code	dimension (mm)		Rated power (W)	WD (W/cm ²)	WC (mm ²)		
			D	L					
○	HLX1101	03081770	6.0	35	50	11	1.25		
○	HLX1152	03081780		50	100	13			
○	HLX1103	03081790		80	150	11			
○	HLX1203	03081800		100	200	12			
	HLA1101	03081720	6.25 (1/4 inch)	50	100	13	1.25		
	HLA1102	03081730		80	100	7.3			
	HLA1152	03081740		100	150	11			
	HLA1103	03081750		100	100	5.7			
	HLA1203	03081760	6.5	50	100	11	1.25		
○	HLB1101	03081020		80	100	12			
○	HLB1102	03081030		100	100	7.0			
○	HLB1152	03081040		100	150	10			
○	HLB1103	03081050	8.0	100	100	5.4	1.25		
○	HLB1203	03081060		100	200	11			
○	HLC1101	03081110		50	100	9.9			
○	HLC1151	03081120		50	150	15			
○	HLC1102	03081130	8.0	80	100	5.7	1.25		
○	HLC1202	03081140		100	200	11			
○	HLC1153	03081150		100	150	6.6			
○	HLC1253	03081160		100	250	11			
○	HLC1204	03081170	8.0	130	200	6.6	1.25		
○	HLC1304	03081180		130	300	9.9			
○	HLC1305	03080010		150	300	8.5			
○	HLC1455	03080020		150	450	13			
○	HLC1356	03080030	8.0	180	350	8.2	1.25		
○	HLC1506	03080040		180	500	12			
○	HLC1407	03080050		200	400	8.4			
○	HLC1607	03080060		200	600	13			
○	HLC1458	03080070	9.42 (3/8 inch)	230	450	8.1	1.25		
○	HLC1658	03080080		230	650	12			
○	HLC1509	03080090		250	500	8.3			
○	HLC1709	03080100		250	700	12			
○	HLC3551	03080110	9.42 (3/8 inch)	300	550	7.5	1.25		
○	HLC3851	03080120		300	850	12			
	HLD1101	03081810		50	100	8.4			
	HLD1201	03081820		50	200	17			
	HLD1152	03081830	9.42 (3/8 inch)	80	150	7.2	1.25		
	HLD1252	03081840		100	250	12			
	HLD1203	03081850		100	200	7.5			
	HLD1303	03081860		100	300	11			
	HLD1204	03081870	9.42 (3/8 inch)	130	200	5.6	1.25		
	HLD1404	03081880		130	400	11			
	HLD1305	03081890		150	300	7.2			
	HLD1505	03081900		150	500	12			
○	HLE1101	03081210	10.0	50	100	8.0	1.25		
○	HLE1201	03081220		50	200	16			
○	HLE1152	03081230		80	150	6.8			
○	HLE1252	03081240		80	250	11			
○	HLE1203	03081250		10.0	100	200		7.1	1.25
○	HLE1303	03081260			100	300		11	
○	HLE1204	03081270			130	200		5.3	
○	HLE1404	03081280			130	400		11	
○	HLE1305	03081290		10.0	150	300		6.8	1.25
○	HLE1505	03081300			150	500		11	
○	HLE1406	03080210			180	400		7.5	
○	HLE1656	03080220			180	650		12	
○	HLE1457	03080230		10.0	200	450		7.5	1.25
○	HLE1707	03080240			200	700		12	

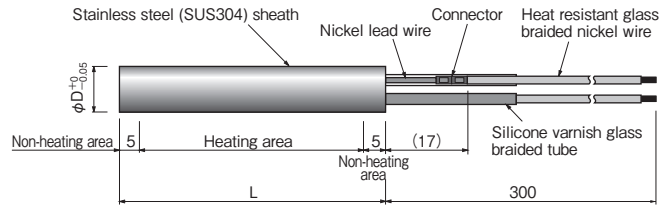
In stock	Model No.	Product code	dimension (mm)		Rated power (W)	WD (W/cm ²)	WC (mm ²)
			D	L			
○	HLE1558	03080250	10.0	230	550	8	1.25
○	HLE1808	03080260			800	12	
○	HLE1609	03080270			600	8	
○	HLE1909	03080280		250	900	12	
○	HLE3701	03080290			700	7.7	
○	HLE3101	03080300			1000	11	
○	HLF1101	03081310	12.0	50	100	6.6	1.25
○	HLF1201	03081320			200	13	
○	HLF1202	03081330			200	7.6	
○	HLF1302	03081340		80	300	11	
○	HLF1253	03081350			250	7.4	
○	HLF1403	03081360			400	12	
○	HLF1304	03081370		100	300	6.6	
○	HLF1504	03081380			500	11	
○	HLF1405	03081390			400	7.6	
○	HLF1605	03081400		150	600	11	
○	HLF1506	03081410			500	7.4	
○	HLF1806	03081420			800	12	
○	HLF1557	03080310		190	550	7.7	
○	HLF1857	03080320			850	12	
○	HLF1708	03080330			700	8.4	
○	HLF1108	03080340		230	1000	12	
○	HLF1709	03080350			700	7.7	
○	HLF1109	03080360			1050	12	
○	HLF3851	03080370	250	850	7.8		
○	HLF3131	03080380		1300	12		
○	HLF1504	03080390		850	12.25		
	HLG1101	03081910	12.6 (1/2 inch)	50	100	6.3	1.25
	HLG1201	03081920			200	13	
	HLG1202	03081930			200	7.2	
	HLG1302	03081940		80	300	11	
	HLG1253	03081950			250	7	
	HLG1403	03081960			400	11	
	HLG1304	03081970		100	300	6.3	
	HLG1504	03081980			500	11	
	HLG1405	03081990			400	7.2	
	HLG1605	03081991		150	600	11	
	HLG1506	03081992			500	7	
	HLG1806	03081993			800	11	
○	HLH1101	03081510	14.0	50	100	5.7	1.25
○	HLH1201	03081520			200	11	
○	HLH1202	03081530			200	6.5	
○	HLH1302	03081540		80	300	9.7	
○	HLH1253	03081550			250	6.3	
○	HLH1453	03081560			450	11	
○	HLH1354	03081570		130	350	6.6	
○	HLH1554	03081580			550	10	
○	HLH1405	03081590			400	6.5	
○	HLH1705	03081600		150	700	11	
○	HLH1556	03081610			550	6.9	
○	HLH1906	03081620			900	11	
○	HLH1657	03080410		190	650	7.8	
○	HLH1107	03080420			1000	12	
○	HLH1758	03080430			750	7.8	
○	HLH1118	03080440		230	1150	12	
○	HLH1809	03080450			800	7.6	
○	HLH1129	03080460			1250	12	
○	HLH3101	03080470	250	1000	7.8		
○	HLH3151	03080480		1500	12		
○	HLH3151	03080480		1500	3.5		

No sign : [Build-to-order]

Please inquire for details on delivery dates

Please provide model no. and product code when placing order.

Sheath diameter $\phi 6.0 \sim 14.0$ (continued)



1P 200V Wire cross-sectional area 1.25 mm²

WD : Watt density of the effective heating area

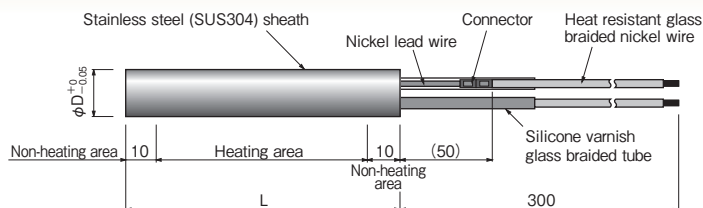
In stock	Model No.	Product code	dimension (mm)		Rated power (W)	WD (W/cm ²)
			D	L		
○	HLX2101	03082770	6.0	35	50	11
○	HLX2152	03082780		50	100	13
○	HLX2103	03082790		80	150	11
○	HLX2203	03082800		100	200	12
	HLA2101	03082720	6.25 (1/4inch)	50	100	13
	HLA2102	03082730		80	100	7.3
	HLA2152	03082740		100	150	11
	HLA2103	03082750		100	200	11
	HLA2203	03082760				
○	HLB2101	03082020	6.5	50	100	12
○	HLB2102	03082030		80	100	7.0
○	HLB2152	03082040		100	150	10
○	HLB2103	03082050		100	200	11
○	HLB2203	03082060				
○	HLC2101	03082110	8.0	50	100	9.9
○	HLC2151	03082120		80	150	15
○	HLC2102	03082130		100	200	11
○	HLC2202	03082140		100	250	11
○	HLC2153	03082150		130	200	6.6
○	HLC2253	03082160		130	300	9.9
○	HLC2204	03082170		150	300	8.5
○	HLC2304	03082180		150	450	13
○	HLC2305	03080510		180	350	8.2
○	HLC2455	03080520		180	500	12
○	HLC2356	03080530		200	400	8.4
○	HLC2506	03080540		200	600	13
○	HLC2407	03080550		230	450	8.1
○	HLC2607	03080560		230	650	12
○	HLC2458	03080570		250	500	8.3
○	HLC2658	03080580		250	700	12
○	HLC2509	03080590	300	550	7.5	
○	HLC2709	03080600	300	850	12	
○	HLC4551	03080610				
○	HLC4851	03080620				
	HLD2101	03082810	9.42 (3/8 inch)	50	100	8.4
	HLD2201	03082820		80	200	17
	HLD2152	03082830		100	150	7.2
	HLD2252	03082840		100	250	12
	HLD2203	03082850		130	200	7.5
	HLD2303	03082860		130	300	11
	HLD2204	03082870		150	200	5.6
	HLD2404	03082880		150	400	11
	HLD2305	03082890		150	300	7.2
	HLD2505	03082900		150	500	12
○	HLE2101	03082210	10.0	50	100	8.0
○	HLE2201	03082220		80	200	16
○	HLE2152	03082230		100	150	6.8
○	HLE2252	03082240		100	250	11
○	HLE2203	03082250		130	200	7.1
○	HLE2303	03082260		130	300	11
○	HLE2204	03082270		150	200	5.3
○	HLE2404	03082280		150	400	11
○	HLE2305	03082290		180	300	6.8
○	HLE2505	03082300		180	500	11
○	HLE2406	03080710		200	400	7.5
○	HLE2656	03080720		200	650	12
○	HLE2457	03080730		200	450	7.5
○	HLE2707	03080740		200	700	12

In stock	Model No.	Product code	dimension (mm)		Rated power (W)	WD (W/cm ²)
			D	L		
○	HLE2558	03080750	10.0	230	550	8.0
○	HLE2808	03080760			800	12
○	HLE2609	03080770		250	600	8.0
○	HLE2909	03080780			900	12
○	HLE4701	03080790	300	700	7.7	
○	HLE4101	03080800		1000	11	
○	HLF2101	03082310	12.0	50	100	6.6
○	HLF2201	03082320		80	200	13
○	HLF2202	03082330		100	200	7.6
○	HLF2302	03082340		100	300	11
○	HLF2253	03082350		130	250	7.4
○	HLF2403	03082360		130	400	12
○	HLF2304	03082370		150	300	6.6
○	HLF2504	03082380		150	500	11
○	HLF2405	03082390		190	400	7.6
○	HLF2605	03082400		190	600	11
○	HLF2506	03082410		200	500	7.4
○	HLF2806	03082420		200	800	12
○	HLF2557	03080810		230	550	7.7
○	HLF2857	03080820		230	850	12
○	HLF2708	03080830		250	700	8.4
○	HLF2108	03080840		250	1000	12
○	HLF2709	03080850	300	700	7.7	
○	HLF2109	03080860	300	1050	12	
○	HLF4851	03080870		850	7.8	
○	HLF4131	03080880		1300	12	
	HLG2101	03082910	12.6 (1/2 inch)	50	100	6.3
	HLG2201	03082920		80	200	13
	HLG2202	03082930		100	200	7.2
	HLG2302	03082940		100	300	11
	HLG2253	03082950		130	250	7.0
	HLG2403	03082960		130	400	11
	HLG2304	03082970		150	300	6.3
	HLG2504	03082980		150	500	11
	HLG2405	03082990		190	400	7.2
	HLG2605	03082991		190	600	11
	HLG2506	03082992		500	7.0	
	HLG2806	03082993		800	11	
○	HLH2101	03082510	14.0	50	100	5.7
○	HLH2201	03082520		80	200	11
○	HLH2202	03082530		100	200	6.5
○	HLH2302	03082540		100	300	9.7
○	HLH2253	03082550		130	250	6.3
○	HLH2453	03082560		130	450	11
○	HLH2354	03082570		150	350	6.6
○	HLH2554	03082580		150	550	10
○	HLH2405	03082590		190	400	6.5
○	HLH2705	03082600		190	700	11
○	HLH2556	03082610		200	550	6.9
○	HLH2906	03082620		200	900	11
○	HLH2657	03080910		230	650	7.8
○	HLH2107	03080920		230	1000	12
○	HLH2758	03080930		250	750	7.8
○	HLH2118	03080940		250	1150	12
○	HLH2809	03080950	250	800	7.6	
○	HLH2129	03080960	300	1250	12	
○	HLH4101	03080970		1000	7.8	
○	HLH4151	03080980		1500	12	

Sheath diameter ϕ 15.0 ~ 20.0 100V

Sheath diameter ϕ 15.0 ~ 20.0 1P 200V

Sheath diameter ϕ 15.0 ~ 20.0



100V

WD : Watt density of the effective heating area WC : Wire cross-sectional area

In stock	Model No.	Product code	dimension (mm)		Rated power (W)	WD (W/cm ²)	WC (mm ²)	
			D	L				
	HLQ1151	03087710	15.0	50	150	11	1.25	
	HLQ1291	03087720			200	14		
	HLQ1252	03087730		80	250	8.8		
	HLQ1402	03087740			400	14		
	HLQ1353	03087750		100	350	9.3		
	HLQ1503	03087760			500	13		
	HLQ1454	03087770		130	450	8.7		
	HLQ1654	03087780			650	13		
	HLQ1555	03087790		150	550	9.0		
	HLQ1805	03087800			800	13		
	HLQ1656	03087810		180	650	8.6		
	HLQ1956	03087820			950	13		
	HLQ1707	03087830		200	700	8.3		
	HLQ1107	03087840			1050	12		2
	HLQ1858	03087850		230	850	8.6		1.25
	HLQ1128	03087860			1250	13		2
	HLQ1909	03087870		250	900	8.3		1.25
	HLQ1139	03087880			1350	12		2
	HLQ3101	03087890	300	1050	8.0			
	HLQ3161	03087900		1600	12	3.5		
	HLR1151	03087910	16.0	50	150	9.9	1.25	
	HLR1251	03087920			250	17		
	HLR1252	03087930		80	250	8.3		
	HLR1402	03087940			400	13		
	HLR1353	03087950		100	350	8.7		
	HLR1553	03087960			550	14		
	HLR1404	03087970		130	400	7.2		
	HLR1704	03087980			700	13		
	HLR1555	03087990		150	550	8.4		
	HLR1855	03088000			850	13		
	HLR1656	03088010		180	650	8.1		
	HLR1956	03088020			950	12		
	HLR1757	03088030		200	750	8.3		
	HLR1117	03088040			1150	13		2
	HLR1908	03088050		230	900	8.5		1.25
	HLR1138	03088060			1300	12		2
	HLR1959	03088070		250	950	8.2		1.25
	HLR1149	03088080			1450	13		3.5
	HLR3111	03088090	300	1150	8.2	2		
	HLR3171	03088100		1750	12	3.5		
	HLS1151	03088110	18.0	50	150	8.8	1.25	
	HLS1251	03088120			250	15		
	HLS1302	03088130		80	300	8.8		
	HLS1452	03088140			450	13		
	HLS1403	03088150		100	400	8.8		
	HLS1603	03088160			600	13		
	HLS1554	03088170		130	550	8.8		
	HLS1804	03088180			800	13		
	HLS1605	03088190		150	600	8.2		
	HLS1955	03088200			950	13		
	HLS1756	03088210		180	750	8.3		
	HLS1116	03088220			1150	13		2
	HLS1857	03088230		200	850	8.4		1.25
	HLS1137	03088240			1300	13		2
	HLS1108	03088250		230	1000	8.4		1.25
	HLS1158	03088260			1500	13		3.5
	HLS1109	03088270		250	1050	8.1		2
	HLS1169	03088280			1600	12		3.5
	HLS3131	03088290	300	1300	8.2	2		
	HLS3191	03088300		1950	12	5.5		

In stock	Model No.	Product code	dimension (mm)		Rated power (W)	WD (W/cm ²)	WC (mm ²)	
			D	L				
	HLT1201	03088310	20.0	50	200	11	1.25	
	HLT1301	03088320			300	16		
	HLT1352	03088330		80	350	9.3		
	HLT1502	03088340			500	13		
	HLT1453	03088350		100	450	9.0		
	HLT1653	03088360			650	13		
	HLT1604	03088370		130	600	8.7		
	HLT1904	03088380			900	13		
	HLT1705	03088390		150	700	8.6		
	HLT1105	03088400			1050	13		2
	HLT1856	03088410		180	850	8.5		1.25
	HLT1126	03088420			1250	12		2
	HLT1957	03088430		200	950	8.4		1.25
	HLT1147	03088440			1400	12		2
	HLT1118	03088450		230	1100	8.3		2
	HLT1168	03088460			1650	13		3.5
	HLT1129	03088470		250	1200	8.3		2
	HLT1189	03088480			1800	12		3.5
	HLT3141	03088490	300	1450	8.2	3.5		
	HLT3221	03088500		2200	13	5.5		

1P 200V

In stock	Model No.	Product code	dimension (mm)		Rated power (W)	WD (W/cm ²)	WC (mm ²)
			D	L			
	HLQ2151	03088510	15.0	50	150	11	1.25
	HLQ2291	03088520			200	14	
	HLQ2252	03088530		80	250	8.8	
	HLQ2402	03088540			400	14	
	HLQ2353	03088550		100	350	9.3	
	HLQ2503	03088560			500	13	
	HLQ2454	03088570		130	450	8.7	
	HLQ2654	03088580			650	13	
	HLQ2555	03088590		150	550	9.0	
	HLQ2805	03088600			800	13	
	HLQ2656	03088610		180	650	8.6	
	HLQ2956	03088620			950	13	
	HLQ2707	03088630		200	700	8.3	
	HLQ2107	03088640			1050	12	
	HLQ2858	03088650		230	850	8.6	
	HLQ2128	03088660			1250	13	
	HLQ2909	03088670		250	900	8.3	
	HLQ2139	03088680			1350	12	
	HLQ4101	03088690	300	1050	8.0		
	HLQ4161	03088700		1600	12		
	HLR2151	03088710	16.0	50	150	9.9	1.25
	HLR2251	03088720			250	17	
	HLR2252	03088730		80	250	8.3	
	HLR2402	03088740			400	13	
	HLR2353	03088750		100	350	8.7	
	HLR2553	03088760			550	14	
	HLR2404	03088770		130	400	7.2	
	HLR2704	03088780			700	13	
	HLR2555	03088790		150	550	8.4	
	HLR2855	03088800			850	13	

No sign : [Build-to-order]

Please inquire for details on delivery dates

Please provide model no. and product code when placing order.

Sheath diameter ϕ 15.0 ~ 20.0 (continued)

1P 200V

WD : Watt density of the effective heating area

WC : Wire cross-sectional area

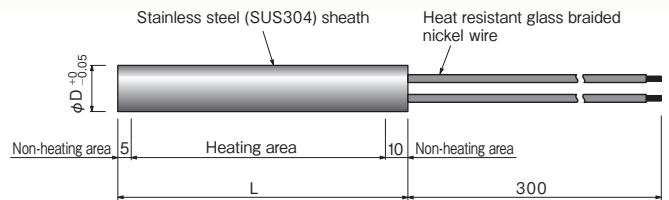
In stock	Model No.	Product code	dimension (mm)		Rated power (W)	WD (W/cm ²)	WC (mm ²)
			D	L			
	HLR2656	03088810	16.0	180	650	8.1	1.25
	HLR2956	03088820			950	12	
	HLR2757	03088830		200	750	8.3	
	HLR2117	03088840			1150	13	
	HLR2908	03088850		230	900	8.5	
	HLR2138	03088860			1300	12	
	HLR2959	03088870		250	950	8.2	
	HLR2149	03088880			1450	13	
	HLR4111	03088890		300	1150	8.2	
	HLR4171	03088900			1750	12	
	HLS2151	03088910	18.0	50	150	8.8	1.25
	HLS2251	03088920			250	15	
	HLS2302	03088930		80	300	8.8	
	HLS2452	03088940			450	13	
	HLS2403	03088950		100	400	8.8	
	HLS2603	03088960			600	13	
	HLS2554	03088970		130	550	8.8	
	HLS2804	03088980			800	13	
	HLS2605	03088990		150	600	8.2	
	HLS2955	03089000			950	13	
	HLS2756	03089010		180	750	8.3	
	HLS2116	03089020			1150	13	
	HLS2857	03089030		200	850	8.4	
	HLS2137	03089040			1300	13	
	HLS2108	03089050		230	1000	8.4	
	HLS2158	03089060			1500	13	

In stock	Model No.	Product code	dimension (mm)		Rated power (W)	WD (W/cm ²)	WC (mm ²)
			D	L			
	HLS2109	03089070	18.0	250	1050	8.1	1.25
	HLS2169	03089080			1600	12	
	HLS4131	03089090		300	1300	8.2	
	HLS4191	03089100			1950	12	
	HLT2201	03089110		20.0	50	200	
	HLT2301	03089120	300			16	
	HLT2352	03089130	80		350	9.3	
	HLT2502	03089140			500	13	
	HLT2453	03089150	100		450	9.0	
	HLT2653	03089160			650	13	
	HLT2604	03089170	130		600	8.7	
	HLT2904	03089180			900	13	
	HLT2705	03089190	150		700	8.6	
	HLT2105	03089200			1050	13	
	HLT2856	03089210	180		850	8.5	
	HLT2126	03089220			1250	12	
	HLT2957	03089230	200		950	8.4	
	HLT2147	03089240			1400	12	
	HLT2118	03089250	230		1100	8.3	
	HLT2168	03089260			1650	13	
	HLT2129	03089270	250		1200	8.3	
	HLT2189	03089280			1800	12	
	HLT4141	03089290	300	1450	8.2		
	HLT4221	03089300		2200	13	2	

SL TYPE

Sheath diameter ϕ 6.25 ~ 10.0 100V

For SL type, the lead is connected to the glass braided nickel wire internally inside the heater.



100V

WD : Watt density of the effective heating area
WC : Wire cross-sectional area

In stock	Model No.	Product code	dimension (mm)		Rated power (W)	WD (W/cm ²)	WC (mm ²)
			D	L			
	SLA1101	03104720	6.25 (1/4 inch)	55	100	13	0.5
	SLA1102	03104730		85	100	7.3	
	SLA1152	03104740		105	150	11	
	SLA1103	03104750			100	5.7	
	SLA1203	03104760		200	11		
◎	SLB1101	03104020	6.5	55	100	12	0.5
◎	SLB1102	03104030		85	100	7.0	
◎	SLB1152	03104040		105	150	10	
◎	SLB1103	03104050			100	5.4	
◎	SLB1203	03104060		200	11		
◎	SLC1101	03104110	8.0	55	100	9.9	0.75
◎	SLC1151	03104120			150	15	
◎	SLC1102	03104130		85	100	5.7	
◎	SLC1202	03104140			200	11	
◎	SLC1153	03104150		105	150	6.6	
◎	SLC1253	03104160			250	11	
◎	SLC1204	03104170		135	200	6.6	
◎	SLC1304	03104180			300	9.9	

In stock	Model No.	Product code	dimension (mm)		Rated power (W)	WD (W/cm ²)	WC (mm ²)		
			D	L					
	SLD1101	03104810	9.42 (3/8 inch)	55	100	8.4	0.75		
	SLD1201	03104820			200	17			
	SLD1152	03104830			85	150		7.2	
	SLD1252	03104840				250		12	
	SLD1203	03104850			105	200		7.5	
	SLD1303	03104860				300		11	
	SLD1204	03104870		135	200	5.6			
	SLD1404	03104880			400	11			
	SLD1305	03104890		155	300	7.2			
	SLD1505	03104900			500	12			
◎	SLE1101	03104210		10.0	55	100		8.0	0.75
◎	SLE1201	03104220				200		16	
◎	SLE1152	03104230	85			150	6.8		
◎	SLE1252	03104240			250	11			
◎	SLE1203	03104250	105		200	7.1			
◎	SLE1303	03104260			300	11			
◎	SLE1204	03104270	135		200	5.3			
◎	SLE1404	03104280			400	11			
◎	SLE1305	03104290	155		300	6.8			
◎	SLE1505	03104300			500	11			

100V

WD : Watt density of the effective heating area
 WC : Wire cross-sectional area

In stock	Model No.	Product code	dimension (mm)		Rated power (W)	WD (W/cm ²)	WC (mm ²)
			D	L			
○	SLF1101	03104310	12.0	55	100	6.6	1.25
○	SLF1201	03104320			200	13	
○	SLF1202	03104330			200	7.6	
○	SLF1302	03104340		85	300	11	
○	SLF1253	03104350			250	7.4	
○	SLF1403	03104360		105	400	12	
○	SLF1304	03104370			300	6.6	
○	SLF1504	03104380		135	500	11	
○	SLF1405	03104390			400	7.6	
○	SLF1605	03104400		155	600	11	
○	SLF1506	03104410			500	7.4	
○	SLF1806	03104420		195	800	12	
	SLG1101	03104910	12.6 (1/2 inch)	55	100	6.3	1.25
	SLG1201	03104920			200	13	
	SLG1202	03104930		85	200	7.2	
	SLG1302	03104940			300	11	
	SLG1253	03104950		105	250	7.0	
	SLG1403	03104960			400	11	
	SLG1304	03104970		135	300	6.3	
	SLG1504	03104980			500	11	
	SLG1405	03104990		155	400	7.2	
	SLG1605	03104991			600	11	
	SLG1506	03104992		195	500	7.0	
	SLG1806	03104993			800	11	
	SLH1101	03104510	14.0	55	100	5.7	1.25
	SLH1201	03104520			200	11	
	SLH1202	03104530		85	200	6.5	
	SLH1302	03104540			300	9.7	
	SLH1253	03104550		105	250	6.3	
	SLH1453	03104560			450	11	
	SLH1354	03104570		135	350	6.6	
	SLH1554	03104580			550	10	
	SLH1405	03104590		155	400	6.5	
	SLH1705	03104600			700	11	
	SLH1556	03104610		195	550	6.9	
	SLH1906	03104620			900	11	

1P 200V

WD : Watt density of the effective heating area
 WC : Wire cross-sectional area

In stock	Model No.	Product code	dimension (mm)		Rated power (W)	WD (W/cm ²)	WC (mm ²)
			D	L			
	SLA2101	03105720	6.25 (1/4 inch)	55	100	13	0.5
	SLA2102	03105730			100	7.3	
	SLA2152	03105740		85	150	11	
	SLA2103	03105750			100	5.7	
	SLA2203	03105760			200	11	
○	SLB2101	03105020	6.5	55	100	12	0.5
○	SLB2102	03105030			100	7	
○	SLB2152	03105040		85	150	10	
○	SLB2103	03105050			100	5.4	
○	SLB2203	03105060			200	11	
○	SLC2101	03105110	8.0	55	100	9.9	0.75
○	SLC2151	03105120			150	15	
○	SLC2102	03105130		85	100	5.7	
○	SLC2202	03105140			200	11	
○	SLC2153	03105150		105	150	6.6	
○	SLC2253	03105160			250	11	
○	SLC2204	03105170			200	6.6	
○	SLC2304	03105180		135	300	9.9	

1P 200V

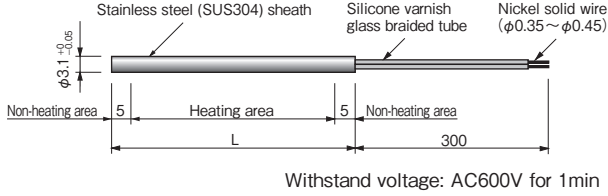
WD : Watt density of the effective heating area
 WC : Wire cross-sectional area

In stock	Model No.	Product code	dimension (mm)		Rated power (W)	WD (W/cm ²)	WC (mm ²)		
			D	L					
	SLD2101	03105810	9.42 (3/8 inch)	55	100	8.4	0.75		
	SLD2201	03105820			200	17			
	SLD2152	03105830			85	150		7.2	
	SLD2252	03105840				250		12	
	SLD2203	03105850			105	200		7.5	
	SLD2303	03105860				300		11	
	SLD2204	03105870		135	200	5.6			
	SLD2404	03105880			400	11			
	SLD2305	03105890		155	300	7.2			
	SLD2505	03105900			500	12			
○	SLE2101	03105210		10.0	55	100		8	0.75
○	SLE2201	03105220				200		16	
○	SLE2152	03105230	85		150	6.8			
○	SLE2252	03105240			250	11			
○	SLE2203	03105250	105		200	7.1			
○	SLE2303	03105260			300	11			
○	SLE2204	03105270	135		200	5.3			
○	SLE2404	03105280			400	11			
○	SLE2305	03105290	155		300	6.8			
○	SLE2505	03105300			500	11			
○	SLF2101	03105310	12.0		55	100	6.6	1.25	
○	SLF2201	03105320				200	13		
○	SLF2202	03105330		85	200	7.6			
○	SLF2302	03105340			300	11			
○	SLF2253	03105350		105	250	7.4			
○	SLF2403	03105360			400	12			
○	SLF2304	03105370		135	300	6.6			
○	SLF2504	03105380			500	11			
○	SLF2405	03105390		155	400	7.6			
○	SLF2605	03105400			600	11			
○	SLF2506	03105410		195	500	7.4			
○	SLF2806	03105420			800	12			
	SLG2101	03105910	12.6 (1/2 inch)	55	100	6.3	1.25		
	SLG2201	03105920			200	13			
	SLG2202	03105930		85	200	7.2			
	SLG2302	03105940			300	11			
	SLG2253	03105950		105	250	7			
	SLG2403	03105960			400	11			
	SLG2304	03105970		135	300	6.3			
	SLG2504	03105980			500	11			
	SLG2405	03105990		155	400	7.2			
	SLG2605	03105991			600	11			
	SLG2506	03105992		195	500	7			
	SLG2806	03105993			800	11			
	SLH2101	03105510	14.0	55	100	5.7	1.25		
	SLH2201	03105520			200	11			
	SLH2202	03105530		85	200	6.5			
	SLH2302	03105540			300	9.7			
	SLH2253	03105550		105	250	6.3			
	SLH2453	03105560			450	11			
	SLH2354	03105570		135	350	6.6			
	SLH2554	03105580			550	10			
	SLH2405	03105590		155	400	6.5			
	SLH2705	03105600			700	11			
	SLH2556	03105610		195	550	6.9			
	SLH2906	03105620			900	11			

INCH SIZE

Sheath diameter $\phi 3.1$
 Sheath diameter $\phi 6.25 \sim 12.60$ 120V

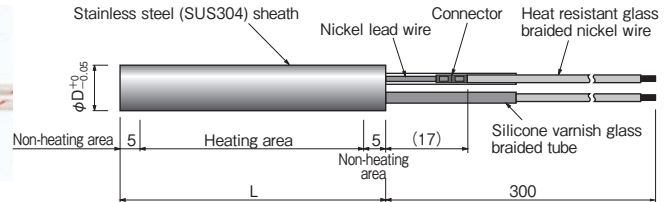
Sheath diameter $\phi 3.1$



WD : Watt density of the effective heating area
 WC : Wire cross-sectional area

In stock	Model No.	Product code	Power voltage	dimension L (mm)	Rated power (W)	WD (W/cm ²)
○	HLJ1021	03083010	120V	31.8	25	12
○	HLJ1051	03083020			50	24
○	HLJ1032	03083030		38.1	30	11
○	HLJ1042	03083040			44	16
○	HLJ1062	03083050			60	22
○	HLJ1053	03083060			50.8	13
○	HLJ1074	03083070		63.5	13	
○	HLJ1115	03083080		88.9	14	
○	HLJ2042	03085010	1P 240V	38.1	44	16
○	HLJ2053	03085020			50.8	13
○	HLJ2074	03085030		63.5	13	
○	HLJ2115	03085040		88.9	14	
○	HLJ2276	03085050		139.7	21	
○					270	

Sheath diameter $\phi 6.25 \sim 12.60$



120V	Wire cross-sectional area	1.25 mm ²
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WD : Watt density of the effective heating area WC : Wire cross-sectional area

In stock	Model No.	Product code	dimension		Rated power (W)	WD (W/cm ²)
			D (inch)	L (mm)		
○	HLK1081	03083090	1/4 (6.25 mm)	25.4	80	26
○	HLK1101	03083100			100	33
○	HLK1151	03083110			150	50
○	HLK1072	03083120		31.8	75	18
○	HLK1102	03083130			100	23
○	HLK1152	03083140			150	35
○	HLK1053	03083150		38.1	50	9.1
○	HLK1103	03083160			100	18
○	HLK1153	03083170			150	27
○	HLK1203	03083180		50.8	200	36
○	HLK1104	03083190			100	12
○	HLK1154	03083200			150	19
○	HLK1204	03083210		76.2	200	25
○	HLK1254	03083220			250	31
○	HLK1105	03083230			100	7.7
○	HLK1205	03083240		101.6	200	15
○	HLK1305	03083250			300	23
○	HLK1106	03083260			100	5.6
○	HLK1206	03083270	3/8 (9.42 mm)	200	11	
○	HLK1306	03083280		300	17	
○	HLL1051	03083290		25.4	55	12
○	HLL1101	03083300	100		22	
○	HLL1151	03083310	150		33	
○	HLL1102	03083320	31.8	100	16	
○	HLL1122	03083330		125	19	
○	HLL1152	03083340		150	23	
○	HLL1202	03083350	38.1	200	31	
○	HLL1053	03083360		50	6.0	
○	HLL1073	03083370		75	9.0	
○	HLL1103	03083380	44.5	100	12	
○	HLL1153	03083390		150	18	
○	HLL1203	03083400		200	24	
○	HLL1253	03083410	125	250	30	
○	HLL1124	03083420		125	12	
○	HLL1174	03083430		175	17	
○	HLL1254	03083440	250	24		

In stock	Model No.	Product code	dimension		Rated power (W)	WD (W/cm ²)
			D (inch)	L (mm)		
○	HLL1055	03083450	3/8 (9.42 mm)	50.8	50	4.1
○	HLL1105	03083460			100	8.3
○	HLL1155	03083470			150	12
○	HLL1205	03083480			200	17
○	HLL1255	03083490			250	21
○	HLL1305	03083500			300	25
○	HLL1405	03083510		57.2	400	33
○	HLL1076	03083520			75	5.4
○	HLL1126	03083530			125	8.9
○	HLL1176	03083540		63.5	175	13
○	HLL1256	03083550			250	18
○	HLL1306	03083560			300	21
○	HLL1356	03083570		76.2	350	25
○	HLL1207	03083580			200	13
○	HLL1257	03083590			250	16
○	HLL1307	03083600		88.9	300	19
○	HLL1407	03083610			400	25
○	HLL1507	03083620			500	32
○	HLL1108	03083630	101.6	100	5.1	
○	HLL1158	03083640		150	7.7	
○	HLL1208	03083650		200	10	
○	HLL1258	03083660	114.3	250	13	
○	HLL1308	03083670		300	15	
○	HLL1408	03083680		400	20	
○	HLL1508	03083690	101.6	500	26	
○	HLL1259	03083700		250	11	
○	HLL1309	03083710		300	13	
○	HLL1509	03083720	114.3	500	21	
○	HLL3121	03083730		125	4.6	
○	HLL3151	03083740		150	5.5	
○	HLL3251	03083750	101.6	250	9.2	
○	HLL3301	03083760		300	11	
○	HLL3401	03083770		400	15	
○	HLL3501	03083780	114.3	500	18	
○	HLL3302	03083790		300	9.7	
○	HLL3502	03083800		500	16	

Sheath diameter $\phi 6.25 \sim 12.60$ 120V / 1P 240V

120V		Wire cross-sectional area	1.25 mm ²			
In stock	Model No.	Product code	dimension		Rated power (W)	WD (W/cm ²)
			D (inch)	L (mm)		
○	HLL3153	03083810	3/8 (9.42 mm)	127.0	150	4.3
○	HLL3303	03083820			300	8.7
○	HLL3503	03083830			500	14
○	HLL3205	03083840		152.4	200	4.7
○	HLL3255	03083850			250	5.9
○	HLL3405	03083860			400	9.5
○	HLL3505	03083870			500	12
○	HLL3605	03083880			600	14
○	HLL3257	03083890			177.8	250
○	HLL3607	03083900		600		12
○	HLL3309	03083910		203.2	300	5.2
○	HLL3509	03083920			500	8.7
○	HLL3609	03083930		254.0	600	10
○	HLL5402	03083940			400	5.5
○	HLL5602	03083950			600	8.3
○	HLL5403	03083960		304.8	400	4.6
○	HLL5603	03083970	600		6.9	
○	HLM1051	03083980	1/2 (12.60 mm)	25.4	50	8.2
○	HLM1151	03083990			150	25
○	HLM1052	03084000		31.8	50	5.8
○	HLM1122	03084010			125	14
○	HLM1053	03084020		38.1	50	4.5
○	HLM1153	03084030			150	13
○	HLM1203	03084040			200	18
○	HLM1074	03084050		50.8	75	4.6
○	HLM1204	03084060			200	12
○	HLM1254	03084070			250	15
○	HLM1304	03084080			300	19
○	HLM1404	03084090		57.2	400	25
○	HLM1075	03084100			75	4.0
○	HLM1125	03084110			125	6.7
○	HLM1255	03084120			250	13
○	HLM1405	03084130		60.3	400	21
○	HLM1505	03084140	500		27	
○	HLM1106	03084150	100		5.0	
○	HLM1256	03084160	250		13	
○	HLM1506	03084170	63.5	500	25	
○	HLM1107	03084180		100	4.7	
○	HLM1257	03084190		250	12	
○	HLM1307	03084200		300	14	
○	HLM1407	03084210	69.8	400	19	
○	HLM1507	03084220		500	24	
○	HLM1408	03084230		400	17	
○	HLM1129	03084240	76.2	125	4.8	
○	HLM1259	03084250		250	9.5	
○	HLM1309	03084260		300	11	
○	HLM1409	03084270		400	15	
○	HLM1509	03084280		500	19	
○	HLM1609	03084290		600	23	
○	HLM1759	03084300	88.9	750	29	
○	HLM3251	03084310		250	8.0	
○	HLM3501	03084320	101.6	500	16	
○	HLM3152	03084330		150	4.1	
○	HLM3252	03084340		250	6.9	
○	HLM3302	03084350		300	8.3	
○	HLM3352	03084360		350	9.7	
○	HLM3402	03084370		400	11	
○	HLM3502	03084380		500	14	
○	HLM3752	03084390		750	21	
○	HLM3503	03084400		114.3	500	12
○	HLM3753	03084410			750	18
○	HLM3204	03084420	127.0	200	4.3	
○	HLM3354	03084430		350	7.6	
○	HLM3404	03084440		400	8.6	

WD : Watt density of the effective heating area WC : Wire cross-sectional area

In stock	Model No.	Product code	dimension		Rated power (W)	WD (W/cm ²)	
			D (inch)	L (mm)			
○	HLM3504	03084450	1/2 (12.60 mm)	127.0	500	11	
○	HLM3754	03084460			750	16	
○	HLM3505	03084470		139.7	500	9.7	
○	HLM3755	03084480			750	15	
○	HLM3706	03084490		146.0	700	13	
○	HLM3257	03084500			250	4.4	
○	HLM3507	03084510			500	8.9	
○	HLM3757	03084520		152.4	750	13	
○	HLM3997	03084530			1000	18	
○	HLM3259	03084540			177.8	250	3.8
○	HLM3509	03084550				500	7.5
○	HLM3609	03084560		203.2	600	9.0	
○	HLM5302	03084570			300	3.9	
○	HLM5502	03084580			500	6.5	
○	HLM5992	03084590		254.0	1000	13	
○	HLM5506	03084600			500	5.2	
○	HLM5996	03084610	304.8	1000	10		
○	HLM5507	03084620		500	4.3		
○	HLM5997	03084630		1000	8.6		

1P 240V用		Wire cross-sectional area	1.25 mm ²				
In stock	Model No.	Product code	dimension		Rated power (W)	WD (W/cm ²)	
			D (inch)	L (mm)			
○	HLK2222	03085060	1/4 (6.25 mm)	31.8	225	53	
○	HLK2173	03085070			175	32	
○	HLK2203	03085080			200	36	
○	HLK2253	03085090		38.1	250	45	
○	HLK2124	03085100			50.8	125	16
○	HLK2154	03085110				150	19
○	HLK2204	03085120				200	25
○	HLK2254	03085130		57.2	250	31	
○	HLK2304	03085140			300	37	
○	HLK2205	03085150		63.5	200	15	
○	HLK2305	03085160			300	23	
○	HLK2206	03085170			76.2	200	11
○	HLK2306	03085180		300		17	
○	HLK2357	03085190		101.6	127.0	350	15
○	HLK2408	03085200			152.4	400	14
○	HLL2201	03085210			127.0	25.4	200
○	HLL2152	03085220	150			23	
○	HLL2202	03085230	200	31			
○	HLL2103	03085240	152.4	31.8	100	12	
○	HLL2153	03085250			150	18	
○	HLL2203	03085260		38.1	200	24	
○	HLL2253	03085270			250	30	
○	HLL2254	03085280	3/8 (9.42 mm)	44.5	250	24	
○	HLL2105	03085290			50.8	100	8.3
○	HLL2155	03085300		150		12	
○	HLL2205	03085310		200		17	
○	HLL2255	03085320		57.2	250	21	
○	HLL2305	03085330			300	25	
○	HLL2405	03085340			400	33	
○	HLL2126	03085350			125	8.9	
○	HLL2256	03085360		63.5	250	18	
○	HLL2306	03085370			300	21	
○	HLL2356	03085380	350		25		
○	HLL2207	03085390	76.2	200	13		
○	HLL2257	03085400		250	16		
○	HLL2307	03085410	300	19			

No sign : [Build-to-order]
Please inquire for details on delivery dates

Please provide model no. and product code when placing order.

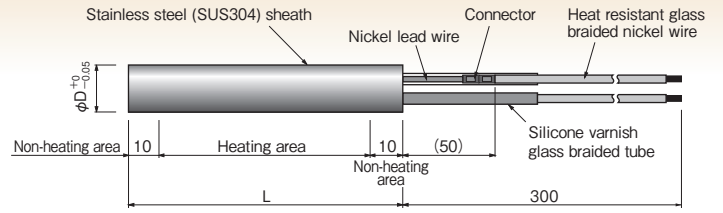
Sheath diameter $\phi 6.25 \sim \phi 12.60$ (continued)

WD : Watt density of the effective heating area
WC : Wire cross-sectional area

1P 240V		Wire cross-sectional area	1.25 mm ²		Rated power (W)	WD (W/cm ²)
In stock	Model No.	Product code	dimension			
			D (inch)	L (mm)		
○	HLL2407	03085420	3/8 (9.42mm)	63.5	400	25
○	HLL2507	03085430			500	32
○	HLL2108	03085440			100	5.1
○	HLL2208	03085450			200	10
○	HLL2258	03085460			250	13
○	HLL2308	03085470			300	15
○	HLL2408	03085480		76.2	400	20
○	HLL2508	03085490			500	26
○	HLL2608	03085500			600	31
○	HLL2259	03085510			250	11
○	HLL2309	03085520			300	13
○	HLL2509	03085530			500	21
○	HLL4121	03085540		101.6	125	4.6
○	HLL4251	03085550			250	9.2
○	HLL4301	03085560			300	11
○	HLL4401	03085570			400	15
○	HLL4501	03085580			500	18
○	HLL4302	03085590			300	9.7
○	HLL4502	03085600		114.3	500	16
○	HLL4153	03085610			150	4.3
○	HLL4303	03085620			300	8.7
○	HLL4503	03085630			500	14
○	HLL4753	03085640			750	22
○	HLL4993	03085650			1000	29
○	HLL4604	03085660		139.7	600	16
○	HLL4994	03085670			1000	26
○	HLL4255	03085680			250	5.9
○	HLL4405	03085690			400	9.5
○	HLL4505	03085700			500	12
○	HLL4605	03085710			600	14
○	HLL4755	03085720	152.4	750	18	
○	HLL4995	03085730		1000	24	
○	HLL4606	03085740		600	13	
○	HLL4996	03085750		1000	22	
○	HLL4257	03085760		250	5.0	
○	HLL4607	03085770		600	12	
○	HLL4997	03085780	177.8	1000	20	
○	HLL4608	03085790		600	11	
○	HLL4998	03085800		1000	19	
○	HLL4309	03085810		300	5.2	
○	HLL4509	03085820		500	8.7	
○	HLL4609	03085830		600	10	
○	HLL4999	03085840	203.2	1000	17	
○	HLL6601	03085850		600	8.8	
○	HLL6991	03085860		1000	15	
○	HLL6602	03085870		600	8.3	
○	HLL6992	03085880		1000	14	
○	HLL6603	03085890		600	6.9	
○	HLL6993	03085900	304.8	1000	11	
○	HLM2122	03085910		125	14	
○	HLM2202	03085920		200	23	
○	HLM2153	03085930		150	13	
○	HLM2203	03085940		200	18	
○	HLM2204	03085950		200	12	
○	HLM2254	03085960	1/2 (12.60mm)	250	15	
○	HLM2304	03085970		300	19	
○	HLM2404	03085980		400	25	
○	HLM2255	03085990		250	13	
○	HLM2405	03086000		400	21	
○	HLM2505	03086010		500	27	
○	HLM2106	03086020	57.2	100	5.0	
○	HLM2256	03086030		250	13	
○	HLM2506	03086040		500	25	
○	HLM2122	03085910		31.8	125	14
○	HLM2202	03085920			200	23
○	HLM2153	03085930			150	13
○	HLM2203	03085940	38.1	200	18	
○	HLM2204	03085950		200	12	
○	HLM2254	03085960		250	15	
○	HLM2304	03085970	50.8	300	19	
○	HLM2404	03085980		400	25	
○	HLM2255	03085990		250	13	
○	HLM2405	03086000	57.2	400	21	
○	HLM2505	03086010		500	27	
○	HLM2106	03086020		100	5.0	
○	HLM2256	03086030	60.3	250	13	
○	HLM2506	03086040		500	25	

In stock	Model No.	Product code	dimension		Rated power (W)	WD (W/cm ²)
			D (inch)	L (mm)		
○	HLM2107	03086050	1/2 (12.60 mm)	63.5	100	4.7
○	HLM2257	03086060			250	12
○	HLM2307	03086070			300	14
○	HLM2407	03086080			400	19
○	HLM2507	03086090			500	24
○	HLM2408	03086100			69.8	400
○	HLM2129	03086110		125		4.8
○	HLM2259	03086120		250		9.5
○	HLM2309	03086130		300		11
○	HLM2409	03086140		400		15
○	HLM2509	03086150		500		19
○	HLM2609	03086160		76.2	600	23
○	HLM2759	03086170			750	29
○	HLM4251	03086180			250	8.0
○	HLM4351	03086190			350	11
○	HLM4501	03086200			500	16
○	HLM4751	03086210			750	24
○	HLM4152	03086220		101.6	150	4.1
○	HLM4252	03086230			250	6.9
○	HLM4302	03086240			300	8.3
○	HLM4352	03086250			350	9.7
○	HLM4402	03086260			400	11
○	HLM4502	03086270			500	14
○	HLM4752	03086280		114.3	750	21
○	HLM4992	03086290			1000	28
○	HLM4503	03086300			500	12
○	HLM4753	03086310			750	18
○	HLM4204	03086320			200	4.3
○	HLM4354	03086330			350	7.6
○	HLM4404	03086340		127.0	400	8.6
○	HLM4504	03086350	500		11	
○	HLM4754	03086360	750		16	
○	HLM4994	03086370	1000		22	
○	HLM4505	03086380	500		9.7	
○	HLM4755	03086390	750		15	
○	HLM4706	03086400	139.7	146.0	700	13
○	HLM4257	03086410		250	4.4	
○	HLM4507	03086420		500	8.9	
○	HLM4757	03086430		750	13	
○	HLM4997	03086440		1000	18	
○	HLM4508	03086450		152.4	500	8.1
○	HLM4998	03086460	1000		16	
○	HLM4509	03086470	500		7.5	
○	HLM4609	03086480	600		9.0	
○	HLM4999	03086490	1000		15	
○	HLM6051	03086500	177.8		500	7.0
○	HLM6101	03086510		1000	14	
○	HLM6052	03086520		500	6.5	
○	HLM6102	03086530		1000	13	
○	HLM6152	03086540		1500	20	
○	HLM6202	03086550		2000	26	
○	HLM6053	03086560	203.2	500	6.1	
○	HLM6103	03086570		1000	12	
○	HLM6054	03086580		500	5.8	
○	HLM6104	03086590		1000	12	
○	HLM6055	03086600		500	5.5	
○	HLM6105	03086610		1000	11	
○	HLM6056	03086620	241.3	500	5.2	
○	HLM6106	03086630		1000	10	
○	HLM6156	03086640		1500	16	
○	HLM6206	03086650		2000	21	
○	HLM6057	03086660		500	4.3	
○	HLM6107	03086670		1000	8.6	
○	HLM6157	03086680	304.8	1500	13	
○	HLM6207	03086690		2000	17	
○	HLM6108	03086700		1000	7.3	
○	HLM6238	03086710		2300	17	
○	HLM6159	03086720		355.6	1500	8.5
○					457.2	1500

Sheath diameter $\phi 15.77 \sim 18.95$



120V		WD : Watt density of the effective heating area WC : Wire cross-sectional area		Rated power (W)	WD (W/cm ²)	WC (mm ²)	
In stock	Model No.	Product code	dimension				
			D (inch)	L (mm)			
	HLN1051	03084640	5/8 (15.77mm)	31.8	50	8.6	1.25
	HLN1201	03084650			200	34	
	HLN1251	03084660			250	43	
	HLN1252	03084670		38.1	250	28	
	HLN1103	03084680		50.8	100	6.6	
	HLN1203	03084690			200	13	
	HLN1104	03084700		57.2	100	5.4	
	HLN1254	03084710			250	14	
	HLN1354	03084720		60.3	350	19	
	HLN1285	03084730			280	14	
	HLN1156	03084740		76.2	150	5.4	
	HLN1256	03084750			250	9.0	
	HLN1506	03084760	95.3	500	18		
	HLN1527	03084770		525	14		
	HLN1258	03084780	101.6	250	6.2		
	HLN1259	03084790	127.0	250	4.7		
	HLN3081	03084800	136.5	800	14		
	HLN3032	03084810	152.4	300	4.6		
	HLN3053	03084820	165.1	500	7.0		
	HLN3054	03084830	177.8	500	6.4		
	HLN3055	03084840	203.2	500	5.5		
	HLN3056	03084850	254.0	500	4.3		
	HLN3057	03084860	304.8	500	3.5		
	HLN3107	03084870		1000	7.1		
	HLP1021	03084880	3/4 (18.95mm)	57.2	200	9.0	1.25
	HLP1022	03084890		76.2	250	7.5	
	HLP1023	03084900		101.6	250	5.1	
	HLP1034	03084910		127.0	300	4.7	
	HLP1055	03084920		152.4	500	6.3	
	HLP1056	03084930		177.8	500	5.3	
	HLP1057	03084940		203.2	500	4.6	

1P 240V		WD : Watt density of the effective heating area WC : Wire cross-sectional area		Rated power (W)	WD (W/cm ²)	WC (mm ²)	
In stock	Model No.	Product code	dimension				
			D (inch)	L (mm)			
	HLN2252	03086730	5/8 (15.77mm)	38.1	250	28	1.25
	HLN2503	03086740			500	33	
	HLN2254	03086750		57.2	250	14	
	HLN2354	03086760			350	19	
	HLN2285	03086770		60.3	280	14	
	HLN2256	03086780			250	9.0	
	HLN2506	03086790		76.2	500	18	
	HLN2756	03086800			750	27	
	HLN2527	03086810		95.3	525	14	
	HLN2258	03086820			250	6.2	
	HLN2408	03086830		101.6	400	9.9	
	HLN2508	03086840			500	12	
	HLN2608	03086850	127.0	600	15		
	HLN2758	03086860		750	19		
	HLN2998	03086870	136.5	1000	25		
	HLN2259	03086880		250	4.7		
	HLN2509	03086890	152.4	500	9.4		
	HLN2759	03086900		750	14		
	HLN2999	03086910	152.4	1000	19		
	HLN4081	03086920		800	14		
	HLN4032	03086930	152.4	300	4.6		
	HLN4052	03086940		500	7.6		
	HLN4072	03086950	152.4	750	11		
	HLN4102	03086960		1000	15		
	HLN4152	03086970	1500	23			

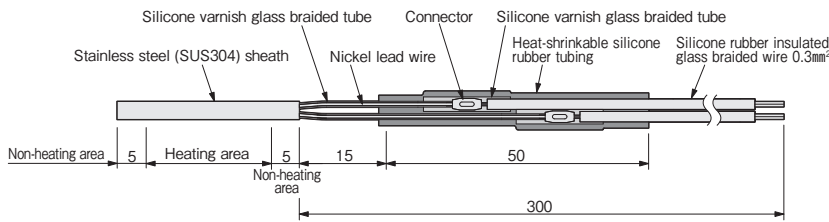
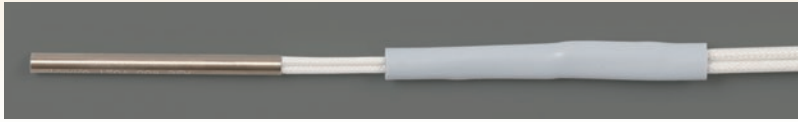
In stock	Model No.	Product code	dimension		Rated power (W)	WD (W/cm ²)	WC (mm ²)
			D (inch)	L (mm)			
	HLN4053	03086980	5/8 (15.77mm)	165.1	500	7.0	1.25
	HLN4054	03086990		177.8	500	6.4	
	HLN4104	03087000		203.2	1000	13	
	HLN4154	03087010			1500	19	
	HLN4055	03087020		254.0	500	5.5	
	HLN4085	03087030			850	9.4	
	HLN4105	03087040		304.8	1000	11	
	HLN4155	03087050			1500	17	
	HLN4205	03087060		355.6	2000	22	
	HLN4056	03087070			500	4.3	
	HLN4106	03087080		406.4	1000	8.6	
	HLN4156	03087090			1500	13	
	HLN4206	03087100	457.2	2000	17		
	HLN4057	03087110		500	3.5		
	HLN4107	03087120	508.0	1000	7.1		
	HLN4157	03087130		1500	11		
	HLN4207	03087140	559.6	2000	14		
	HLN4378	03087150		3700	22		
	HLN4079	03087160	609.6	750	4.2		
	HLN4249	03087170		2400	13		
	HLN4409	03087180	660.4	4000	22		
	HLN6251	03087190		2500	13		
	HLN6451	03087200	711.2	4500	24		
	HLN6302	03087210		3000	14		
	HLN6472	03087220	762.0	4700	22		
	HLN6153	03087230		1500	6.2		
	HLN6353	03087240	812.8	3500	14		
	HLN6473	03087250		4700	19		
	HLN6204	03087260	863.6	2000	6.8		
	HLN6474	03087270		4700	16		
	HLN6305	03087280	914.4	3000	6.8		
	HLP2052	03087290	3/4 (18.95mm)	76.2	500	15	1.25
	HLP2053	03087300		101.6	500	10	
	HLP2103	03087310		127.0	1000	21	
	HLP2054	03087320			500	7.8	
	HLP2104	03087330		152.4	1000	16	
	HLP2055	03087340			500	6.3	
	HLP2105	03087350		177.8	1000	13	
	HLP2205	03087360			2000	25	
	HLP2056	03087370		203.2	500	5.3	
	HLP2106	03087380			1000	11	
	HLP2057	03087390		254.0	500	4.6	
	HLP2107	03087400			1000	9.2	
	HLP2207	03087410	304.8	2000	18		
	HLP2108	03087420		1000	7.2		
	HLP2208	03087430	355.6	2000	14		
	HLP2109	03087440		1000	5.9		
	HLP2209	03087450	406.4	2000	12		
	HLP2409	03087460		4000	24		
	HLP4121	03087470	457.2	1250	6.3		
	HLP4251	03087480		2500	13		
	HLP4451	03087490	508.0	4500	23		
	HLP4152	03087500		1500	7.0		
	HLP4183	03087510	559.6	1800	7.8		
	HLP4473	03087520		4700	20		
	HLP4204	03087530	610.4	2000	7.7		
	HLP4504	03087540		5000	19		
	HLP4115	03087550	661.2	1150	4.0		
	HLP4225	03087560		2250	7.7		
	HLP4525	03087570	712.0	5250	18		
	HLP4136	03087580		1375	3.9		
	HLP4276	03087590	762.8	2750	7.8		
	HLP4556	03087600		5500	16		
	HLP4257	03087610	914.4	2500	4.7		

No sign : [Build-to-order]

Please inquire for details on delivery dates

Please provide model no. and product code when placing order.

φ3.1, φ4.0 Ultra Five terminal options



- Nickel solid wire is replaced with silicone rubber insulated wire (copper stranded wire).
- Silicone varnish glass braided tube, which is used to protect the nickel lead wire, is securely fixed.
- Due to the structure of the terminal, maximum operating temperature is 280°C (mold temperature).
- The maximum operating temperature is 180°C for the heat-shrinkable silicone rubber tubing and the silicone rubber insulated glass braided copper stranded wire.

Optional electric wires are available (Please specify the length when placing order)

Applicable models	Type	Electric wire type	Shape	Max. operating temperature*2
HL type or inch size	Standard	Heat resistant glass braided nickel wire		300°C *1
	Option 1 For sheath dia. of φ3.1 and above	FEP insulated wire		200°C
	Option 2 For sheath dia. of φ3.1 and above	Silica wool insulated wire		400°C *1
	Option 3 For sheath dia. of φ8 and above	Nickel solid wire + ceramic bead		500°C
SL type *3	Standard	Heat resistant glass braided nickel wire		300°C
	Option 1 For sheath dia. of φ12 and above	Silica wool insulated wire		400°C

*1 : Max. operating temperature for wire connection protection tube is 250°C.

*2 : Temperature will rise due to current flow, operating ambient temperature should be at least 50°C lower.

*3 : The max. length of the wire for SL type is 500mm. Although it is possible to extend by connecting cables, the max. operating temp. for the wire connection protection tube is 250°C.

Built to order Ultra Five's dimension range

Please inquire for dimensions that are out of range.

Sheath diameter (φ mm)	Sheath length min. (mm)~max. (mm)
2.3	*1 15 ~ 100
3.1 / 4.0	25 ~ 140
6.0 / 6.25 / 6.5	25 ~ 350
8.0 / 9.42	25 ~ 400
10.0	25 ~ 500
12.0 / 12.6	25 ~ 600
14.0	25 ~ 1000
15.0 / 15.77 / 16.0 / 18.0	40 ~ 1600 *2
18.95 / 20.0	45 ~ 1800 *2

Depending on the voltage and power, manufacturing may not be possible even if it is in the dimension range.

*1 : Special specifications with a min. length of 12mm is possible.

*2 : Max. length for SL type is 1000mm

To use "Ultra Five" correctly

For cartridge heaters, it is important to make sure that the heat is well conducted to the heated metal part.

- The difference between the inserted hole diameter and the heater diameter should be minimized. (0.1mm and below: φ10.1 hole for φ10 heater)
- The inner surface of the hole should be smooth. Reaming is recommended.
- Please remove the oil used for hole machining. Remaining oil will become carbon products when heated, which will reduce heat conductivity.
- The heater can be used at voltages lower than the rated voltage. In this case, please use the following to calculate the power.

$$\left(\frac{\text{Operating voltage}}{\text{Rated voltage}} \right)^2 \times \text{Rated power} = \text{Operating power}$$

(Eg.) 120V 500W heater used at 100V will result in 347W.

- Special terminal (p20) is recommended if HL type/inch size is used for movable parts.
- When stored or not operated for long period, insulation resistance will drop due to the nature of the heater. Depending on operating conditions, if drop in insulation resistance needs to be avoided, please choose New Ultra Five (p21) or Glass Seal Cartridge Heaters (p22).

Ultra Five Special Terminal Specifications

Delivery within 7 working days

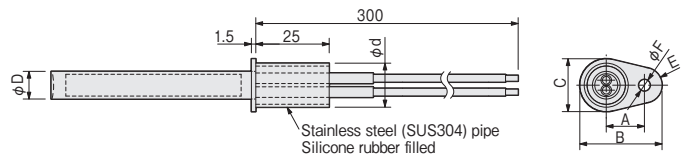
- Applicable to standard HL type/inch size (ϕ 3.1- ϕ 20.0) Ultra Five products. The terminal is attached with B type flange, connecting pipe and others.
- Lead wire is excellent in withstanding bends, suitable for use in movable parts.
- Heater insertion length is shorten by the thickness of the flange (1.5mm).
- For stocked Ultra Five HL/inch size type standard products, delivery is within 7 working days (out of stock might occur).

Specifications & dimensions

Flange material: SUS304 (Stainless steel)
Fixing method of heater with flange and flange with pipe: TIG welding

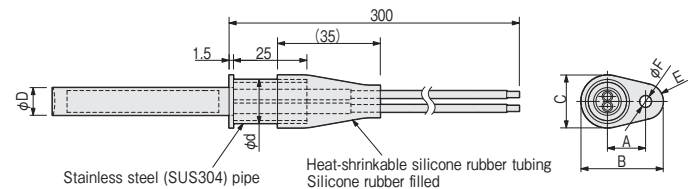
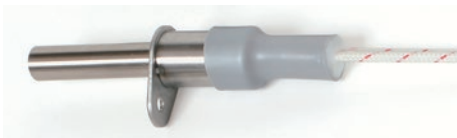
Type 1

Max. operating temperature of terminal : 180°C



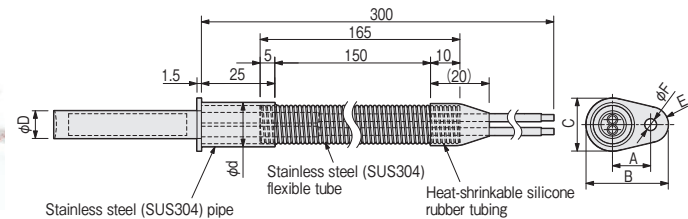
Type 2

Max. operating temperature of terminal : 180°C



Type 3

Max. operating temperature of terminal : 220°C



Heater sheath diameter ϕ D	Dimensions (mm)					
	ϕ d	A	B	C	E	F
3.1 / 4.0	8	8	15.5	9	R3	3.2
6.0 / 6.25 / 6.5 / 8.0	10	9	20	14	R4	4.2
9.42 / 10.0 / 12.0 / 12.6	15	13	28	18	R6	4.2
14.0 / 15.0 / 15.77 / 16.0 / 18.0 / 18.95 / 20.0	22	15	34	24	R7	4.2

How to order

Standard stocked items, Ultra Five HL/SL/inch size type (sheath dia. ϕ 3.1- ϕ 14), with special terminal are short delivery items. Please specify the model no. and product code using the following method.

Model No.	Standard stocked item's model No.		Type 1	Type 2	Type 3
	□□□□□□	⇒	□□□□□□ T1	□□□□□□ T2	□□□□□□ T3
Product code	標準在庫品の商品コード		Type 1	Type 2	Type 3
	0308 □□□□	⇒	0313 □□□□	0314 □□□□	0315 □□□□
	0310 □□□□	⇒	0323 □□□□	0324 □□□□	0325 □□□□

Example) HLB1103 (HL type, ϕ 6.5 × 100, 100V100W) with type 1 special terminal

Model No. : HLB1103 → HLB1103T1
Product code : 03081050 → 03131050

For build to order products with special terminal, please specify the model no. and type of special terminal as in "HLA2103 Special Terminal Type 1". Also, please inquire on the delivery dates.

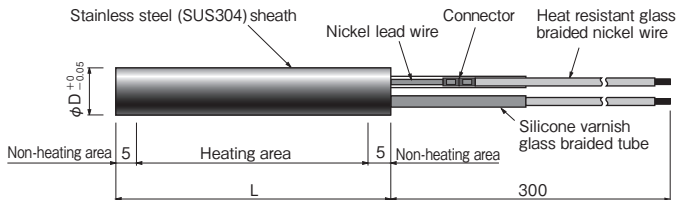
NEW ULTRA FIVE

Cartridge heater that can prevent the drop in insulation resistance when not used for long period after installation or when storing.

- All standard products of Ultra Five (p9-p18 sheath dia. $\phi 6$ and above) can be customized into "New Ultra Five" with the same specifications.
- HL type for 1P 200V with sheath diameter of $\phi 6.5$, $\phi 8.0$ and $\phi 10.0$ are standard stocked items.

High insulation resistance type cartridge heater

(max. operating temperature: heater surface temperature 400°C)



HL Type 1P 200V applications

In stock	Model No.	Product code	dimension (mm)		Rated power (W)	WD (W/cm ²)
			D	L		
◎	HLB2101S	03182020	6.5	50	100	12
◎	HLB2102S	03182030		80	100	7.0
◎	HLB2152S	03182040		100	150	10
◎	HLB2103S	03182050		100	100	5.4
◎	HLB2203S	03182060		100	200	11
◎	HLC2101S	03182110	8.0	50	100	9.9
◎	HLC2151S	03182120		50	150	15
◎	HLC2102S	03182130		80	100	5.7
◎	HLC2202S	03182140		80	200	11
◎	HLC2153S	03182150		100	150	6.6
◎	HLC2253S	03182160		100	250	11
◎	HLC2204S	03182170		130	200	6.6
◎	HLC2304S	03182180		130	300	9.9
◎	HLC2305S	03180510		150	300	8.5
◎	HLC2455S	03180520		150	450	13
◎	HLC2356S	03180530		180	350	8.2
◎	HLC2506S	03180540		180	500	12
◎	HLC2407S	03180550		200	400	8.4
◎	HLC2607S	03180560		200	600	13
◎	HLC2458S	03180570		230	450	8.1
◎	HLC2658S	03180580	230	650	12	
◎	HLC2509S	03180590	250	500	8.3	
◎	HLC2709S	03180600	250	700	12	
◎	HLC4551S	03180610	300	550	7.5	
◎	HLC4851S	03180620	300	850	12	
◎	HLE2101S	03182210	10.0	50	100	8.0
◎	HLE2201S	03182220		50	200	16
◎	HLE2152S	03182230		80	150	6.8
◎	HLE2252S	03182240		80	250	11
◎	HLE2203S	03182250		100	200	7.1
◎	HLE2303S	03182260		100	300	11
◎	HLE2204S	03182270		130	200	5.3
◎	HLE2404S	03182280		130	400	11
◎	HLE2305S	03182290		150	300	6.8
◎	HLE2505S	03182300		150	500	11
◎	HLE2406S	03180710		180	400	7.5
◎	HLE2656S	03180720		180	650	12
◎	HLE2457S	03180730		200	450	7.5
◎	HLE2707S	03180740		200	700	12
◎	HLE2558S	03180750		230	550	8.0
◎	HLE2808S	03180760		230	800	12
◎	HLE2609S	03180770		250	600	8.0
◎	HLE2909S	03180780		250	900	12
◎	HLE4701S	03180790		300	700	7.7
◎	HLE4101S	03180800		300	1000	11

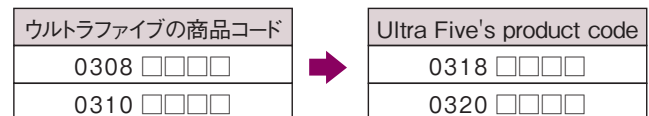
How to order

◎ are build to order products. Please specify the model no. and product code using the following method.

Model no.



Product code



Example) To change HLB1103 (HL type, $\phi 6.5 \times 100, 100W$) into "New Ultra Five"

Model no. : HLB1103 → HLB1103S

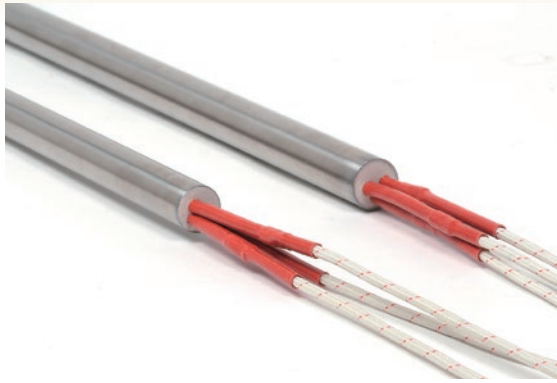
Product code : 03081050 → 03181050

Types with flange or internal thermocouple can be manufactured.

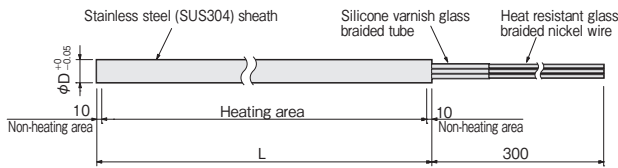
About the selection of "New Ultra Five"

For cartridge heaters, if not used for long period in humid season, insulation resistance will drop due to the humidity in the air. In this case, it is required to recover the insulation resistance using methods such as powering it at low voltage before reusing (when operation starts, moisture will be removed shortly and the insulation resistance will recover). "New Ultra Five" is a cartridge heater that can prevent this insulation resistance drop.

- The effect of preventing insulation resistance drop will deteriorate if the heater is operated at surface temperatures exceeding 400°C. It should also be noted that if it is above 600°C, the effect will be loss within a short amount of time.
- Although insulation resistance drop will not be a problem when operated at temperature exceeding the max. operating temperature, the life of the heater will be less than 1/2 of the standard Ultra Five.
- For operating conditions where insulation resistance drop will not occur, there is no merit in using "New Ultra Five". Please use standard Ultra Five products.
- For high temperature operations, when insulation resistance drop due to long stopping period must be prevented, it is required to use standard Ultra Five with extended non-heating area (out of the mold) and employ a fully seal design. (Please refer Glass Seal Cartridge Heaters on p22)



Suitable for packaging machine, bag forming equipment or other heat sealing applications



WD : Watt density of the effective heating area WC : Wire cross-sectional area

In stock	Model No.	Product code	Power voltage	dimension (mm)		Rated power (kW)	WD (W/cm ²)	WC (mm ²)	Weight (kg)
				D	L				
	HLS6301	03089310	3P 200V	18.0	800	3.0	6.8	1.25	0.9
	HLS6352	03089320			900	3.5	7.0	2.0	1.0
	HLS6403	03089330			1000	4.0	7.2		1.1
	HLS6454	03089340			1100	4.5	7.4	3.5	1.2
	HLS6505	03089350			1200	5.0	7.5		1.3
	HLT6351	03089360	3P 200V	20.0	800	3.5	7.1	2.0	1.1
	HLT6402	03089370			900	4.0	7.2	3.5	1.2
	HLT6453	03089380			1000	4.5	7.3		1.4
	HLT6504	03089390			1100	5.0	7.4	3.5	1.5
	HLT6555	03089400			1200	5.5	7.4		1.6

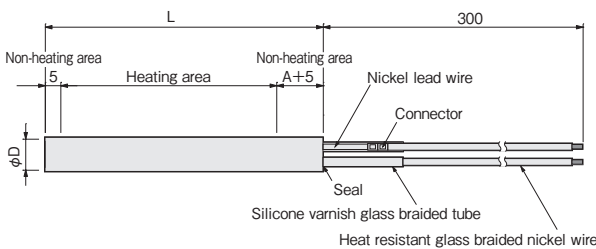
GLASS SEAL CARTRIDGE HEATERS

High insulation resistance type cartridge heater with glass sealed terminal

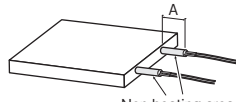


- Cartridge heater with glass sealed terminal for high insulation resistance.
- Insulation resistance will not deteriorate even when not used for long period.
- Design for high temperature operation with the non-heating area (dimension A figure below) extended out of the heated object (hot plate).

● Sheath diameter ϕD $\phi 8 / \phi 10$



Application



Sheath:	NCF800
Power supply wire:	Heat resistant glass braided nickel wire

Max. operating temperature for terminal: 250°C (temp. of seal)※1

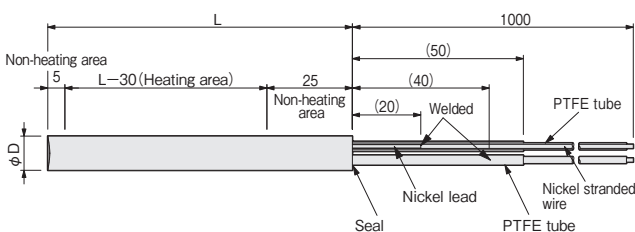
Sheath diameter ϕD	$\phi 8$	$\phi 10$
dimension L (mm)	100~400	100~500

A dimension (reference): at RT 25°C, for stainless steel hot plate

Temp. of hot plate (°C)	300	400	500	600	700	800
dimension A (mm)	20	30	35	40	45	50

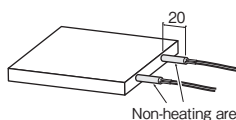
The dimensions above are for reference only. If operated in high ambient temperature, please increase the length of A.

For vacuum ● Sheath diameter ϕD $\phi 8 / \phi 10$



Application

On the terminal side, the non-heating area should be 20mm away.



Sheath:	NCF800
---------	--------

Power supply wire:	Nickel stranded wire + PTFE
--------------------	-----------------------------

Max. operating temperature for terminal: 250°C (temp. of seal)※1

Rated voltage:	100V and below
----------------	----------------

Wire cross-sectional area: 1.0 W/cm²

Sheath diameter ϕD	$\phi 8$	$\phi 10$
dimension L (mm)	100 ~ 400	100 ~ 500

※1 : If used above max. operating temperature, insulation resistance will drop and short circuit might occur at the sealed area.

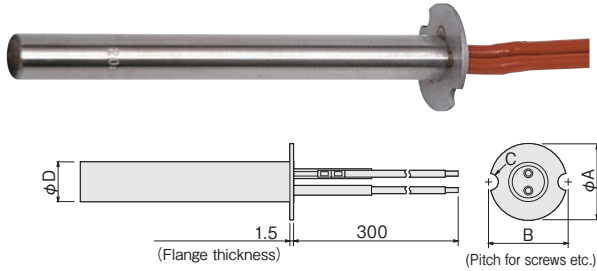
CARTRIDGE HEATERS w/ FLANGE

Cartridge heaters with flange attached to the terminal. Heater can be easily fixed by using screws etc.

- Build to order products using the same flange can be manufactured.
- Heater insertion length will be shortened by the thickness of the flange (1.5mm).

○ : Products made by attaching flange to standard stocked items are "short delivery items".

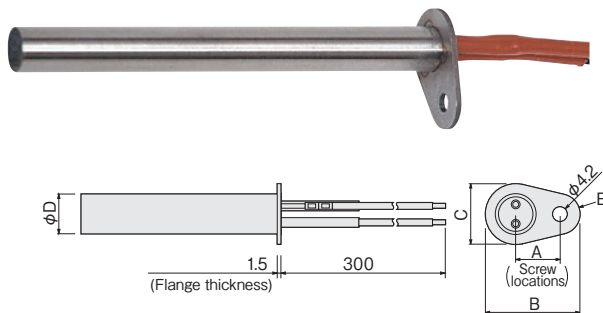
● A type flange



Flange material : SUS304
Heater and flange attachment method : TIG welding

Heater sheath diameter ϕD	Dimensions (mm)		
	A	B	C
6.0 / 6.25 / 6.5 / 8.0	18	18	R2.5
9.42 / 10.0 / 12.0 / 12.6	24	24	R2.5
14.0 / 15.0 / 15.77 / 16.0	28	28	R3
18.0 / 18.95 / 20.0	32	32	R3

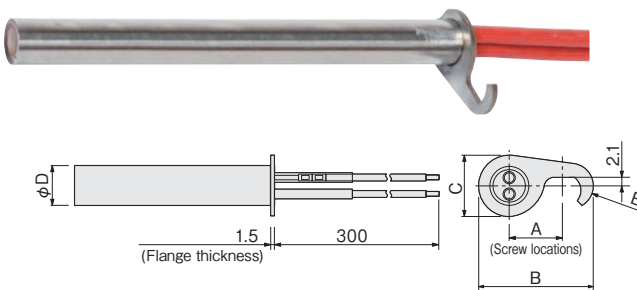
● B type flange



Flange material : SUS304
Heater and flange attachment method : TIG welding

Heater sheath diameter ϕD	Dimensions (mm)			
	A	B	C	E
6.0 / 6.25 / 6.5 / 8.0	9	20	14	R4
9.42 / 10.0 / 12.0 / 12.6	13	28	18	R6
14.0 / 15.0 / 15.77 / 16.0 / 18.0 / 18.95 / 20.0	15	34	24	R7

● C type flange



- Heater replacement is possible by just loosening the screw.
- Screw positions that varies within some range can be tolerated.
- Please use M4 screws.

Flange material : SUS304
Heater and flange attachment method : TIG welding

Heater sheath diameter ϕD	Dimensions (mm)			
	A	B	C	E
6.0 / 6.25 / 6.5	7~10	18.5	9	R4.5
8.0	8.5~11	20.5	10	R5
9.42 / 10.0 / 12.0 / 12.6	11~15	28	15	R5.5
14.0 / 15.0 / 15.77 / 16.0 / 18.0 / 18.95	14~16	32.5	21	R7
20.0	14.5~17	36	22	R8

How to order

Standard stocked items, Ultra Five HL/SL/inch size type (sheath dia. $\phi 3.1$ - $\phi 14$), with flange attached are short delivery items. Please specify the model no. and product code using the following method.

Model No.	Standard stocked item's model No.	A type	B type	C type
	□□□□□□	□□□□□□ AF	□□□□□□ BF	□□□□□□ CF
Product code	Standard stocked item's product code	A type	B type	C type
	0308 □□□□	0371 □□□□	0372 □□□□	0312 □□□□
	0310 □□□□	0361 □□□□	0362 □□□□	0322 □□□□

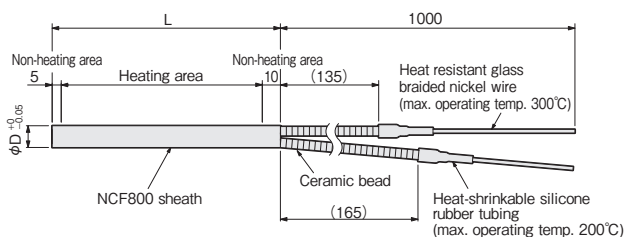
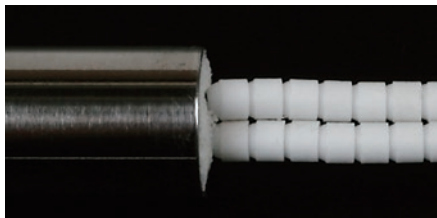
Example) HLB1103 (HL type, $\phi 6.5 \times 100, 100V100W$) with A type flange.

Model No. : HLB1103 → HLB1103AF
Product code : 03081050 → 03711050

For build to order products with flange attached, please specify the model no. and type of flange as in "HLA2103 A type flange". Also, please inquire on the delivery dates.

HIGH TEMPERATURE RESISTANCE CARTRIDGE HEATERS

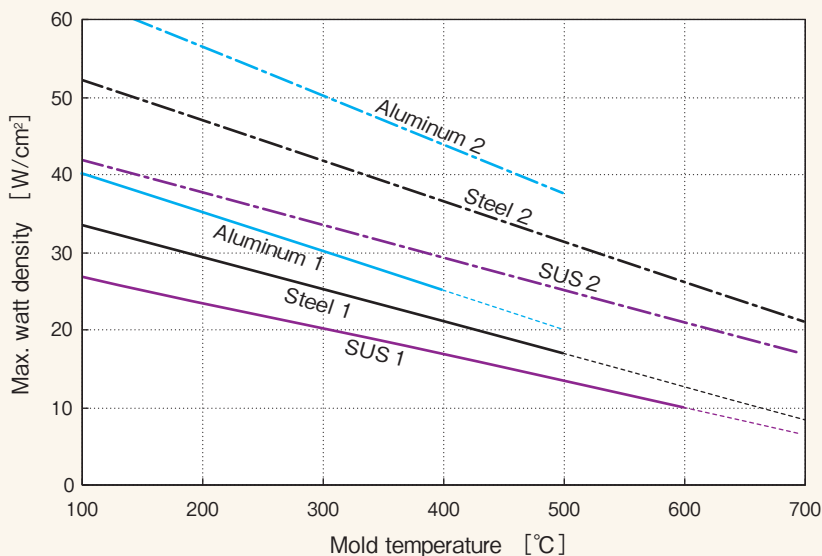
WD : Watt density of the effective heating area



- Cartridge heater with a maximum operating temperature of 800°C (temp. of the mold). Heater sheath is made of temperature resistance alloy (NCF800).
- Please operating in environment in which the ambient temperature for the heat resistant wire is below 250°C.
- Please do not use in applications where the ceramic bead part will be bended frequently.

100V			1P 200V			Dimensions (mm)		Rated power (W)	WD (W/cm ²)	
In stock	Model No.	Product code	In stock	Model No.	Product code	D	L			
	GLC1101	03280010		GLC2101	03282010	8.0	50	100	11.4	
	GLC1152	03280020		GLC2152	03282020		80	150	9.2	
	GLC1202	03280030		GLC2202	03282030		200	200	12.2	
	GLC1203	03280040		GLC2203	03282040		100	250	9.4	
	GLC1303	03280050		GLC2303	03282050			300	300	14.0
	GLC1254	03280060		GLC2254	03282060		130	250	8.6	
	GLC1354	03280070		GLC2354	03282070			350	350	12.1
	GLC1305	03280080		GLC2305	03282080		150	300	8.8	
	GLC1455	03280090		GLC2455	03282090			450	450	13.3
	GLC1356	03280100		GLC2356	03282100		180	350	9.0	
	GLC1506	03280110		GLC2506	03282110			500	500	12.8
	GLC1407	03280120		GLC2407	03282120		200	400	8.6	
	GLC1607	03280130		GLC2607	03282130			600	600	12.9
	GLC1458	03280140		GLC2458	03282140		230	450	8.3	
	GLC1708	03280150		GLC2708	03282150			700	700	13.0
	GLC1509	03280160		GLC2509	03282160		250	500	8.5	
	GLC1809	03280170		GLC2809	03282170			800	800	13.5
				GLC4601	03282180		300	600	8.4	
				GLC4901	03282190			900	900	12.6
				GLC4702	03282200		350	700	8.3	
				GLC4102	03282210			1050	1050	12.5
				GLC4803	03282220		400	800	8.3	
				GLC4123	03282230			1200	1200	12.4
	GLE1101	03280510		GLE2101	03282510		10.0	50	100	9.1
	GLE1151	03280520		GLE2151	03282520			150	150	13.6
	GLE1152	03280530		GLE2152	03282530			80	150	8.7
	GLE1252	03280540		GLE2252	03282540				250	250
	GLE1253	03280550		GLE2253	03282550			100	350	13.1
	GLE1353	03280560		GLE2353	03282560				500	500
	GLE1304	03280570		GLE2304	03282570			130	300	8.3
	GLE1504	03280580		GLE2504	03282580	500			500	13.8
	GLE1355	03280590		GLE2355	03282590	150		350	8.3	
	GLE1555	03280600		GLE2555	03282600			550	550	13.0
	GLE1456	03280610		GLE2456	03282610	180		450	8.7	
	GLE1656	03280620		GLE2656	03282620			650	650	12.5
	GLE1507	03280630		GLE2507	03282630	200		500	8.6	
	GLE1707	03280640		GLE2707	03282640			700	700	12.0
	GLE1608	03280650		GLE2608	03282650	230		600	8.9	
	GLE1858	03280660		GLE2858	03282660			850	850	12.6
	GLE1659	03280670		GLE2659	03282670	250		650	8.8	
	GLE1909	03280680		GLE2909	03282680			900	900	12.2
	GLE3751	03280690		GLE4751	03282690	300		750	8.4	
	GLE3101	03280700		GLE4111	03282700			1100	1100	12.3
				GLE4902	03282710	350		900	8.6	
				GLE4132	03282720			1300	1300	12.4
				GLE4103	03282730	400		1000	8.3	
				GLE4153	03282740			1500	1500	12.4

Reference for "mold temperature-heater max. watt density" for different mold materials



《The number after the material》

1: Long term usage (20,000hrs at 95% reliability)

2: Short term usage (1,000hrs average life)

- This is the case where the diameter of the inserted hole is equal to the heater diameter+0.1mm ($\phi 10.1$ hole for $\phi 10$ heater). If the inserted hole diameter is large, the heat transfer coefficient from the heater to the mold will drop, and the life will be shorten.
- The lifetime varies with the conditions of usage and the specifications of the heater.
- The data is for reference purposes, it does not guarantee the lifetime.
- For inch size cartridge heater that are used for 100V (120V) and 200 (240V), the power and watt density will be approximately 70%.
- For use in movable parts, the life due to the damage of wire is not considered.

No sign : [Build-to-order]
Please inquire for details on delivery dates

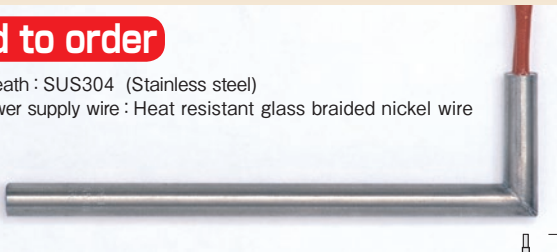
Please provide model no. and product code when placing order.

L TYPE CARTRIDGE HEATERS

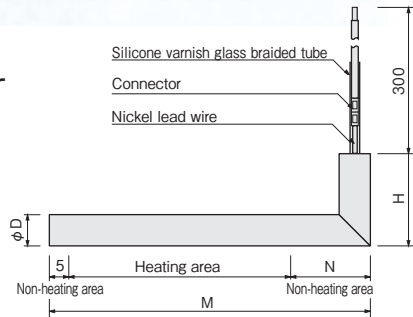
Ultra Five HL type cartridge heater with right angle terminal.

Build to order

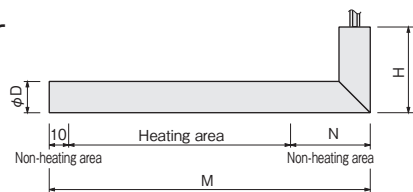
Sheath : SUS304 (Stainless steel)
Power supply wire : Heat resistant glass braided nickel wire



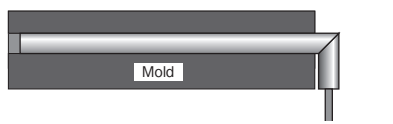
● Sheath diameter $\phi 6.25 \sim \phi 14.0$



● Sheath diameter $\phi 15.0 \sim \phi 20.0$



Mold installation



- The heater can be attached in a manner that limited space is effectively used .
- L type heaters with the same specifications as HL/inch size type can be delivered (standard products with sheath diameter $\phi 6.25 - \phi 20.0$).
- When placing order for standard product with L type modification, please specify the standard product model no. and H dimensions as in "HLL3153, L type, H dimension: 25".

Sheath diameter $\phi 6.25 \sim \phi 14.0$

Sheath diameter ϕD	Dimensions M			Dimension N (Non-heating area)	Dimension H	
	min	max	For HL type		min	max
$\phi 6.25$	38	350	M = L + 13	18	20	35
$\phi 6.5$						
$\phi 8.0$	42	400	M = L + 17	22	20	35
$\phi 9.42$	45	400	M = L + 20	25	25	40
$\phi 10.0$	45	500				
$\phi 12.0$	50	600	M = L + 25	30	25	40
$\phi 12.6$						
$\phi 14.0$	65	1000	M = L + 30	35	30	50

Sheath diameter $\phi 15.0 \sim \phi 20.0$

Sheath diameter ϕD	Dimensions M			Dimension N (Non-heating area)	Dimension H	
	min	max	For HL type		min	max
$\phi 15.0$	65	1600	M = L + 25	35	30	50
$\phi 15.77$						
$\phi 16.0$	70	1800	M = L + 30	40	40	50
$\phi 18.0$						
$\phi 18.95$						
$\phi 20.0$						

CARTRIDGE HEATERS FOR VACUUM

Cartridge heater which are fully sealed with ceramic hermetic seal for vacuum applications.

Build to order

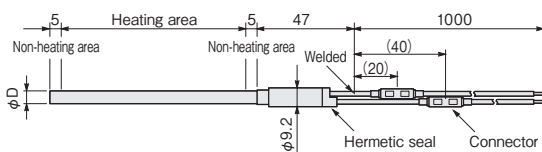


Sheath : SUS304(stainless steel)
Power supply wire : FEP insulated wire

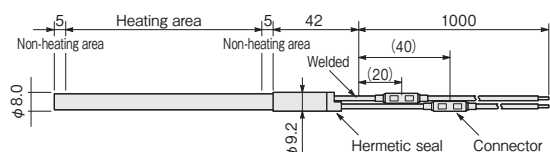
L type can be manufactured



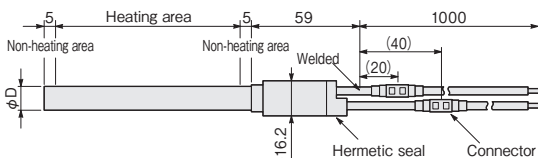
● Sheath diameter $\phi 6.25 / 6.5$



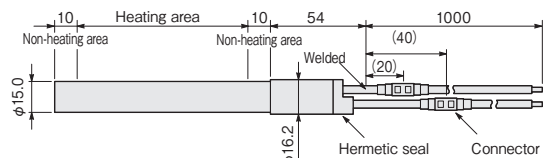
● Sheath diameter $\phi 8.0$



● Sheath diameter $\phi 9.42 / 10.0 / 12.0 / 12.6 / 14.0$



● Sheath diameter $\phi 15.0$

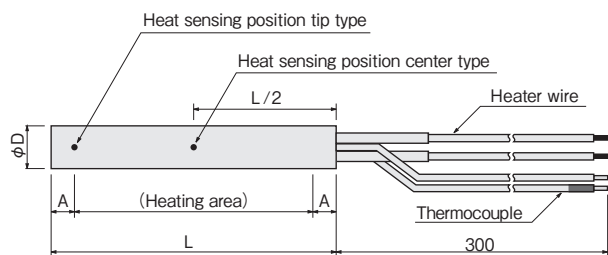


CARTRIDGE HEATERS w/ INTERNAL THERMOCOUPLE

Cartridge heater with built-in internal K-type thermocouple.

● Standard type **Build to order**

- HL type cartridge heater with internal K-type thermocouple. Suitable for controlling heating in small spaces, as the heater and temperature sensor can be installed together.
- Heaters with internal thermocouple using the same specifications as HL/inch size type can be manufactured (standard products with sheath diameter $\phi 6.25$ - $\phi 20.0$).
- The standard thermocouple sensing positions are "tip" and "center" of the sheath.
- For built to order items, heaters with other thermocouple sensing position can be manufactured.



Heater sheath : SUS304 (Stainless steel)
 Thermocouple : K-type (Lead with glass braided tube, red color indication for positive wire)
 Heater wire : Heat resistant glass braided nickel wire

*** For ordering ***
 When placing order for standard product with internal thermocouple, please specify the standard product model no. and heat sensing position as in "Cartridge heater w/ internal thermocouple, HLL3153, heat sensing position tip".

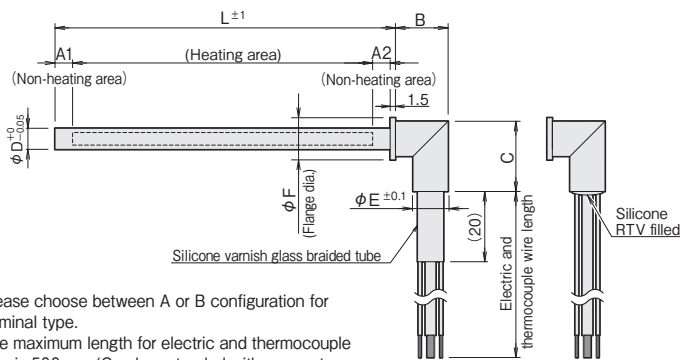
Sheath diameter ϕD	Dimensions (mm)			Thermocouple wire diameter	
	L (min)	L (max)	A (Non-heating area)		
$\phi 6.0$	25	350	5	$\phi 0.5$	
$\phi 6.25$					
$\phi 6.5$					
$\phi 8.0$	25	400			
$\phi 9.42$					
$\phi 10.0$					
$\phi 12.0$	25	600			
$\phi 12.6$					
$\phi 14.0$	25	1000			
$\phi 15.0$					
$\phi 15.77$	40	1600	10	$\phi 0.65$	
$\phi 16.0$					
$\phi 18.0$					
$\phi 18.95$					1800
$\phi 20.0$					

● L Type **Build to order**

- SL type cartridge heater with built-in internal K-type thermocouple.
- The wire connection terminal part has a L configuration. Can be fitted compactly within the space in the direction of insertion.
- SL type cartridge heaters of sheath diameter $\phi 6.0$ - $\phi 20.0$ with internal thermocouple, attached with stopper flange and L shape metal part for protection.
- The standard thermocouple heat sensing positions are "tip" and "center" of the sheath.
- Heaters with special flange, other heat sensing positions and other lengths for electric wire/thermocouple wire can be manufactured.
- 2 types of terminal configuration can be selected to suit the application.



*** For ordering ***
 When placing order for standard SL type product with internal thermocouple, please specify the standard product model no., heat sensing position and terminal type as in "Cartridge heater w/ internal thermocouple, SLE1204, heat sensing position tip, A type terminal".



• Please choose between A or B configuration for terminal type.
 • The maximum length for electric and thermocouple wire is 500mm. (Can be extended with connector for 500mm and above)

A type terminal Terminal max. operating temp.: 250°C
B type terminal Terminal max. operating temp.: 200°C

Heater sheath : SUS304 (Stainless steel)
 Thermocouple : K-type (Lead with glass braided tube, red color indication for positive wire)
 Heater wire : Heat resistant glass braided nickel wire

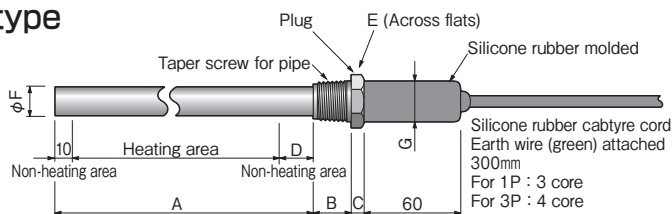
Sheath diameter ϕD	Dimensions (mm)								Thermocouple wire diameter
	L Min.	L Max.	A1	A2	B	C	ϕE	ϕF	
$\phi 6.0$	25	350	5	8.5	15	20	$\phi 10$	$\phi 10$	$\phi 0.5$
$\phi 6.25$									
$\phi 6.5$									
$\phi 8.0$	25	400							
$\phi 9.42$									
$\phi 10.0$									
$\phi 12.0$	25	600							
$\phi 12.6$									
$\phi 14.0$	25	1000							
$\phi 15.0$									
$\phi 15.77$	40	1000	10	8.5	25	30	$\phi 15$	$\phi 17$	$\phi 0.65$
$\phi 16.0$									
$\phi 18.0$									
$\phi 18.95$							$\phi 20$		
$\phi 20.0$								$\phi 22$	

CARTRIDGE HEATER FOR WATER HEATING

Compact and high power cartridge heaters for water heating that can be installed in small spaces. Generate heat with high heating efficiency and low loss.

- Water heater that is based on the highly recognized cartridge heater "Ultra Five".
- Long life with robust design that can withstand mechanical vibrations or shocks during operation.
- Improved water resistance with heat resistant silicone rubber molded terminal.
- Can be installed in small spaces where conventional plug heaters could not.
- The metal sheath is made of stainless steel pipe (SUS316L) or copper pipe (nickel plated surface).

ULTRA W Stainless steel sheath type

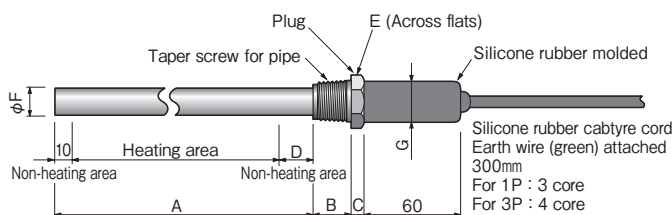


Heater sheath : SUS316L (Stainless steel)
 Plug : SUS304 (Stainless steel)
 Watt density of the effective heating area : 7 W/cm²

WC : Wire cross-sectional area

In stock	Model No.	Product code	Power voltage	Rated power	Nominal dia. of taper screw	Dimensions (mm)							WC (mm ²)	Weight (kg)
						A	B	C	D	E	F	G		
○	SLW6052	03734210	110V	500W	R 3/8	220	16	6	20	21	12	20	0.75	0.2
○	SLW6103	03734220		1kW	R 1/2	320	20	7	25	24	16	24		0.4
○	SLW6154	03734230		1.5kW	R 3/4	380	20	7	25	30	20	28		1.25
○	SLW7052	03734240	220V	500W	R 3/8	220	16	6	20	21	12	20	0.75	0.2
○	SLW7103	03734250		1kW	R 1/2	320	20	7	25	24	16	24		0.4
○	SLW7154	03734260		1.5kW	R 3/4	380	20	7	25	30	20	28		1.25
○	SLW7204	03734270	2kW	490		20	7	25	30	20	28	1.25	0.9	
○	SLW8103	03734280	220V	1kW	R 1/2	330	20	7	25	24	16	24	0.75	0.5
○	SLW8154	03734290		1.5kW	R 3/4	390				30	20	28		0.8
○	SLW8204	03734300		2kW	R 3/4	500				30	20	28		1.0

ULTRA W Copper sheath type



Heater sheath : Nickel plated C1220T (Copper pipe)
 Plug : Nickel plated brass
 Watt density of the effective heating area : 15 W/cm²

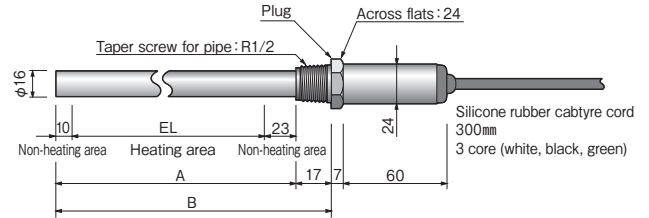
WC : Wire cross-sectional area

In stock	Model No.	Product code	Power voltage	Rated power	Nominal dia. of taper screw	Dimensions (mm)							WC (mm ²)	Weight (kg)	
						A	B	C	D	E	F	G			
○	SLW1052	03734010	110V	500W	R 3/8	120	16	6	20	21	12	20	0.75	0.2	
○	SLW1103	03734020		1kW	R 1/2	170	20	7	25	24	16	24		0.3	
○	SLW1154	03734030		1.5kW	R 3/4	195	20	7	25	30	20	28		1.25	0.4
○	SLW2052	03734040	220V	500W	R 3/8	120	16	6	20	21	12	20	0.75	0.2	
○	SLW2103	03734050		1kW	R 1/2	170	20	7	25	24	16	24		0.3	
○	SLW2154	03734060		1.5kW	R 3/4	195	20	7	25	30	20	28		1.25	0.4
○	SLW2204	03734070		2kW		250	20	7	25	30	20	28		1.25	0.5
○	SLW2304	03734080		3kW		355	20	7	25	30	20	28		1.25	0.7
○	SLW3103	03734090	220V	1kW	R 1/2	175	20	7	25	24	16	24	0.75	0.3	
○	SLW3154	03734100		1.5kW	R 3/4	200				30	20	28		0.5	
○	SLW3204	03734110		2kW	R 3/4	255				30	20	28		0.6	
○	SLW3304	03734120		3kW	R 3/4	360				30	20	28		0.8	

● ULTRA W800

Small and high power cartridge heater for water heating. It uses high performance nickel alloy sheath that can withstand corrosion and heat.

- Sheath is made of high performance nickel alloy NCF800 which can resist corrosion and heat. Compact and high power that can withstand high stress, corrosion and cracking.
- The terminal is molded with high water resistant silicone rubber. Can be operated as a single unit or as a set of multiple units to match the installation space.



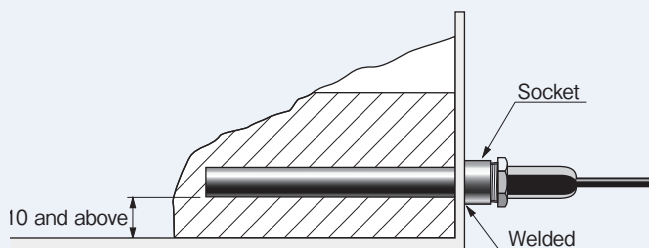
Heater sheath : NCF800
 Plug : SUS304L (Stainless steel)
 Terminal : Silicone rubber molded (SUS protection pipe attached)
 Power supply cable : Silicone rubber cable cord 300mm
 Watt density of the effective heating area : 20W/cm²

In stock	Model No.	Product code	Power voltage	Rated power	Dimensions (mm)			Wire cross-sectional area (mm ²)	Weight (kg)
					A	B	EL		
◎	SLW4210	03550010	3P 220V	1 kW	133	150	100	0.75	0.3
◎	SLW4215	03550015		1.5 kW	183	200	150		0.4
◎	SLW4225	03550025		2.5 kW	283	300	250		0.5
◎	SLW4230	03550030		3 kW	333	350	300	1.25	0.5
◎	SLW4250	03550050		5 kW	533	550	500		0.7

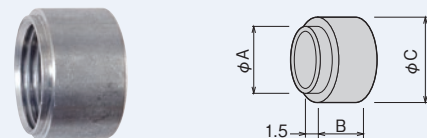
To use cartridge heater for water (oil, chemical) heating correctly

- Please be careful to not expose the heater sheath into the air. If operated while exposed in air (dry-fired), the temperature of the heater sheath will be very high, and it might cause a fire or burnout.
- Please use Hakko's socket or other products that matches the dimensions for installation. If long socket is used, the heater's heating area will be exposed into the socket, and it might cause high temperatures and burnout.
- Deposits will form on the surface of the heater sheath if used for long period. The deposits will hinder the heater's heat transfer, and it might cause burnout or corrosion. Please check and remove routinely.

● Installation method



Socket for installation (SUS304)



Model No.	Product code	Nominal screw diameter for pipe	Dimensions (mm)		
			A	B	C
ZCS0211	03440015	R 3/8	19	12	22
ZCS0212	03440025	R 1/2	24	15	27
ZCS0213	03440035	R 3/4	30	17	33

CARTRIDGE HEATERS FOR OIL, CHEMICAL AND SEAWATER HEATING

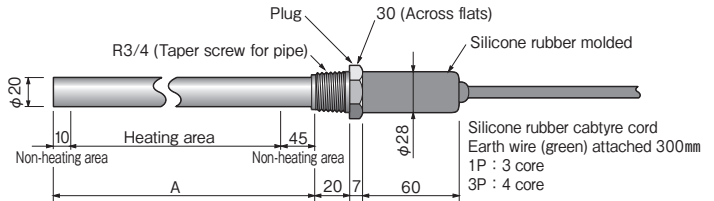
For applications where installation space is limited

● ULTRA WL Oil temperature max. 160°C type

- Compact cartridge heaters for oil heating that can be installed in small spaces. Generate heat with high heating efficiency and low loss.
- Stainless steel sheath (SUS316L) has excellent corrosion resistance properties. Can be used for liquid other than oil such as alkaline solutions (solutions that do not corrode stainless steel).



Heater sheath : SUS316L (Stainless steel)
 Plug : SUS304L (Stainless steel)
 Watt density of the effective heating area : 2.5 W/cm²



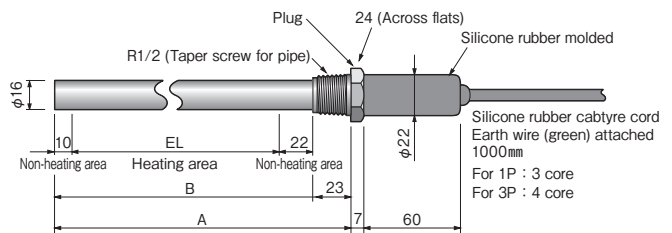
In stock	Model No.	Product code	Power voltage	Rated power	Dimensions A	Wire cross-sectional area (mm ²)	Weight (kg)
○	SLW5125	03740020	110V	250W	215	0.75	0.4
○	SLW5135	03740030		350W	280		0.6
○	SLW5150	03740040		500W	375		0.7
○	SLW5225	03740050	1P 220V	250W	215		0.4
○	SLW5235	03740060		350W	280		0.6
○	SLW5250	03740070		500W	375		0.7
○	SLW5325	03740080	3P 220V	250W	215		0.4
○	SLW5335	03740090		350W	280		0.6
○	SLW5350	03740100		500W	375		0.7

● ULTRA W for seawater heating

- The sheath is made from pure titanium which has excellent corrosion resistance properties. Suitable for chemicals or seawater heating.
- Lightweight for easy installation.
- As it comes with a plug, it can be securely attached to the tank.
- Long life with robust design that can withstand mechanical vibrations or shocks during operation.
- Improved water resistance with heat resistant silicone rubber molded terminal.



Heater sheath, plug : Titanium
 Watt density of the effective heating area : 5 W/cm²

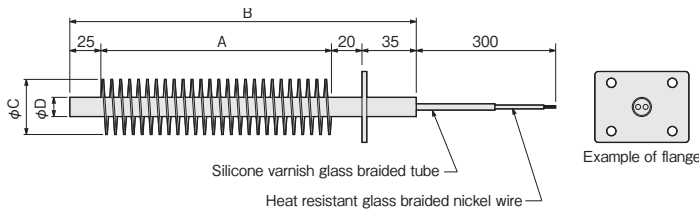


In stock	Model No.	Product code	Power voltage	Rated power	Dimensions (mm)			Wire cross-sectional area (mm ²)	Power plug	Weight (kg)
					A	B	EL			
○	SLW0105	03750510	100V	500W	255	232	200	0.75	2P+E plug attached	0.3
○	SLW0110	03750520								0.4
○	SLW0210	03750530	1P 200V	1kW	455	432	400		None	0.4
○	SLW0310	03750540	3P 200V							

CARTRIDGE HEATERS w/ FINS

Build to order

Ultra Five cartridge heater attached with fins for air heating. It can be attached from one side for a compact machine design.



● Standard specifications

Heater sheath, fin, flange material : SUS304 (Stainless steel)

Heater and flange : Fully TIG welded

Please operate with the heater sheath temperature below 400°C .
Please specify the flange shape and dimensions.

Sheath diameter ϕD	Dimensions (mm)		
	A	B	ϕC
12	100 ~ 425	175 ~ 500	28
16	100 ~ 845	175 ~ 920	32
18	100 ~ 845	175 ~ 920	34
20	100 ~ 875	175 ~ 950	36

Cartridge heater's special specifications

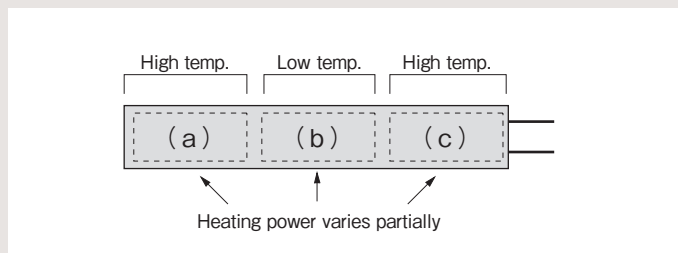
The specifications listed here are examples. Various modifications can be made according to customer request.

Classification	Shape	Features and application
Vacuum application	Hermetic system	Hermetic part is used in the terminal. It can be used in vacuum. Please use it for applications such as mold heating in vacuum.
Water resistant type	Metal collar	Metal collar is welded to the terminal to protect the terminal from external environment. It is suitable for use in humid environment, heat sealer that gets dusty easily, or metal molds that are exposed to oil, water, resin etc.
	Silicone tube	The heater terminal is protected from water droplets or humid environments using a simple design. Please operate with a terminal temperature of 150°C and below.
	Molded	Designed to protect the heater terminal from water droplets or condensations. Highly reliable waterproof performance is assured. Depending on the type of rubber material used, 2 types of operating temperature, 60°C and 150°C, are available. Suitable for outdoor anti-freezing, localized heating of freezer equipments, water heating or steam heating.
Metal cap type	Right angle	Metal cap is attached to the terminal to fully protect it. Suitable for metal molds with rapid movements, parts that might be exposed to resin, or applications where appearance are considered. This design is also suitable for metal molds that require frequent heater replacement.
	Straight	
Hollow type		Heater with an internal hollow pipe. The hollow pipe can be used for sensor insertion or cooling. Heater with 2 internal hollow pipes are also available.
Balanced type		The cartridge heater's heating distribution can be design freely to match the operating conditions. Request for design, simulation and testing are supported.

HYBRID CARTRIDGE HEATERS

■ Hybrid cartridge heaters

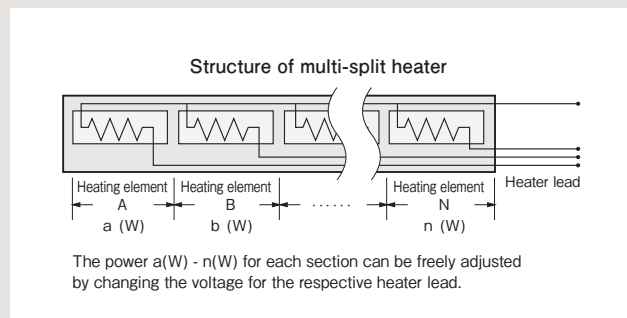
Conventional cartridge heater's heating wire is uniformly wound inside the sheath, which can only produce uniform heating power. For hybrid cartridge heater, the heating power can be partially adjusted within one heater.



There will be large heat loss from the sides of heating applications such as hot plate. By using hybrid cartridge heater with higher heating power at both ends [in the figure above, the heating power for (a) and (c) is larger than (b)], the higher heat loss can be compensated to produce a more uniform temperature distribution. Hakko's uniform hot plate uses hybrid cartridge heaters. Also, the heater surface can be coated with Hakko's Hilex coating to provide uniform heating for oven applications. Hakko's far infrared conveyor oven uses Hilex hybrid cartridge heaters.

■ Multi-split heater

Multi-split heater has multiple separated heating element that can be controlled independently. It can produce any temperature distribution as you please in addition to uniform heating. Temperature control of wide area can be carried out with multiple combinations.

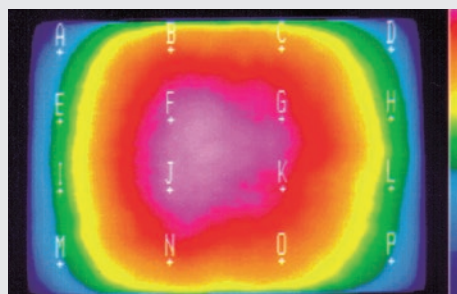


It is ideal for hot plates or furnaces that require temperature gradient. It is also suitable for uniform temperature hot plate. Hilex coated type can also be manufactured.

Comparison for a hot plate using conventional cartridge heaters and hybrid cartridge heaters (same hot plate with only the heaters replaced).

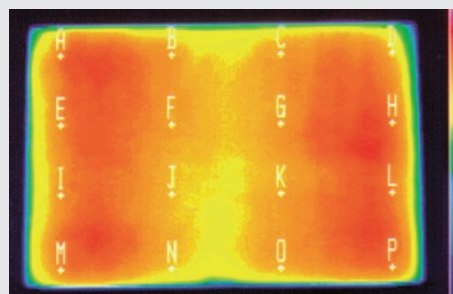
Hot plate dimension	500 × 300 × t50
Hot plate material	SUS304
Rated power	5.7kW
Heater dimension	φ14 × L 500, 7 cartridge heaters
Hot plate set temperature	200°C
Temp. measurement method	Infrared thermometer
Measurement points	16 points
Surrounding environment	23°C, 67%RH, still air

Using conventional cartridge heaters



Max. temperature (Max)	: 195°C
Min. temperature (Min)	: 178°C
Average temperature (\bar{X})	: 186.5°C
Deviation (δ_{n-1})	: 6.1°C
Temperature difference (Max - Min)	: 17°C

Using hybrid cartridge heaters



Max. temperature (Max)	: 202°C
Min. temperature (Min)	: 200°C
Average temperature (\bar{X})	: 201.5°C
Deviation (δ_{n-1})	: 0.7°C
Temperature difference (Max - Min)	: 2°C

The contents published is as of October 2020. For improvements, specifications are subject to change without notice. Updates are also posted on our homepage. www.hakko.co.jp

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